

(cont'd)

Training Course		Number of Trainees (persons)	Training Period (month)	Time of Training (time/year)	Number of Personnel to be Trained (persons/year)
Re-training	Senior officer candidate (III)	40	3	2	80
Special training	Special rescue (IV-1)	20	6	2	40
	Rescue diving (IV-2)	30	3	3	90
	Disaster prevention (IV-3)	40	1	3	120
	Information Communications (IV-4)	40	3	3	120
	Navigation aids (IV-5)	20	3	3	60
	Harbour traffic control (IV-6)	20	3	3	60
	Miscellaneous				50
Total			200 to 250		Approx. 700

6.4 Plan of Facilities

The training facilities will have a sufficient space to cultivate the maritime safety personnel, and will be equipped with the latest equipment.

A construction site with sufficient space will be sought in the Jakarta area considering the facility of securing instructors and personnel eligible for maritime safety, and obtaining the latest information.

6.4.1 Basic Plan of Facilities

(1) Outline of Facilities Plan

The basic plan of the facilities consists of buildings, training facilities and materials and equipment for training. Consideration is taken to create an environment so that trainees can be trained fully according to the contents of the maritime safety training. The outline of the basic plan is as follows: (Refer to Fig. A.6.1 through Fig. A.6.5 of APPENDIX VI.)

(i) Buildings

The basic function of the buildings is divided into three categories --- administration, training and living functions, and those functions and buildings will be interconnected systematically with each other.

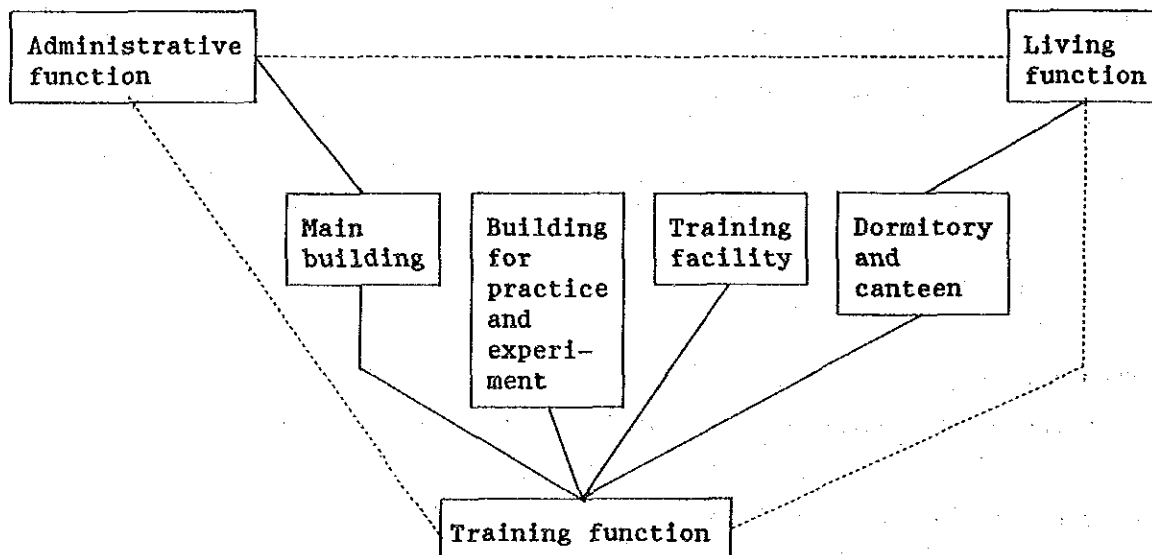


Fig. 6.4.1 Basic Function of the Buildings

(ii) Training Facilities

Training facilities mean various facilities for training to be externally installed, which consist of the following.

- a) Training tower for rangers
- b) Swimming pool
- c) Fire fighting facilities
- d) Gymnasium

(iii) Materials and Equipment for Training

Materials and equipment for training mean those used for practice and experiment to be installed in buildings. Such materials and equipment will be installed in the MSTC in such a way that the training related to sea rescue, SAR, etc., is effectively conducted and abilities necessary for maritime safety personnel can be cultivated. (Refer to Table A.6.6 of APPENDIX VI for detailed.)

(2) Structure and Floor Area of Main Facilities

It is planned that the buildings will be of reinforced concrete (RC) with a mat foundation. According to the plan mentioned in this report, the MSTC will be constructed on a coastal area, but the stratum with sufficient bearing capacity may not be found. Immediately after the construction site is decided, the type of foundation will be decided according to the results of soil investigation.

(i)	Main building	RC structure	Two-story
(ii)	Building for practice and experiment	RC structure	Two-story
(iii)	Auditorium and gymnasium	RC structure (steel structure roofing)	Two-story
(iv)	Dormitory and canteen	RC structure	Two-story
(v)	Other	Rc structure	One-story
(vi)	Training facilities		
	a) Training tower for rangers		
	b) Swimming pool		
	c) Fire fighting facilities		
	d) Other		
(vii)	Pier		

(3) Area of Facilities

Classrooms, practice and experiment rooms, and training facilities will be arranged considering the contents of training and the number of trainees. The MSTC will have sufficient space to conduct sufficient training activities.

Site area	70,000 m ²
Building area	7,400 m ²
Total floor area	11,600 m ²
(Breakdown)	
Main building, practice/experiment building	6,000 m ²
Auditorium and gymnasium	2,000 m ²
Dormitory and canteen	2,300 m ²
Other	1,300 m ²

(4) Approximate Construction Cost

(i) Buildings	Rp. 20,600 million
(ii) Training facilities	Rp. 9,100 million
(iii) Materials and equipment for training	Rp. 16,000 million
Total	Rp. 45,700 million

6.5 Administration and Management of The MSTC

6.5.1 Administration and Management

The MSTC will be directly controlled by the DGSC. The MSTC will consist of four sections of administration, instructors, training and R&D, and will be operated under the control of the superintendent of the center.

It is desirable that the MSTC personnel are given leadership training by experts for training the maritime safety personnel to smooth training activities and improve training effects, because there are a variety of training courses requiring a high level of knowledge and skill. A tentative administrative organization chart of the MSTC is shown in Fig. A.6.6 of APPENDIX VI.

6.5.2 Securing and Cultivating Instructors

Experts in each section of the DGSC will be assigned as instructors, but cooperation from external instructors will be obtained as necessary, because there is a variety of training courses.

To secure and cultivate personnel suitable for instructors, the MSTC encourages personnel to participate in overseas training, as required, to improve their abilities as instructors, because training courses in the MSTC are specific.

6.5.3 Maintenance Cost

If the maintenance cost is calculated with reference to that of the existing facilities, the cost is estimated to be approx. Rp. 300 to 350 million per year. (Refer to 6.5.3 of APPENDIX VI.)

6.6 Time Schedule for Cultivating Maritime Safety Personnel

Preparations for the training system and facilities are required to establish the MSTC.

Since the training plan consists of a variety of subjects and fields, preliminary coordination among all quarters concerned is needed for promotion of this plan. In view of this situation, the following time schedule is suggested.

Table 6.6.1 Tentative Time Schedule for Construction of the MSTC

Item	1989	1990	1991	1992	1993
Preparation of administrative organization					
Securing and cultivating of instructors and administration staff					
Preparation of training plan and curricula, etc.					
Detailed design					
Construction and procurement of materials and equipment					
Opening of the MSTC					

7 Organizational System

- 7.1 Operations Office System and Its Related Organization**
- 7.2 Reinforcement of Ship Repair and Maintenance Personnel for Maritime Safety Rescue Ships**
- 7.3 Marine Disaster Prevention System and Its Organization**
- 7.4 Special Rescue System and Its Organization**
- 7.5 Harbour Traffic Control System and Its Organization**
- 7.6 Establishment of the MSTC**
- 7.7 Cost Estimation**

Section 7 Organizational System

The administration of the DGSC is carried out under a much large organization including the DGSC, Maritime District Offices (KANWILs), Local Operations Units, etc., and this organization plays a vital role in bringing prosperity to this archipelago nation.

As the socio-economy has evolved, the development plan has been steadily promoted so as to cope with the increasing needs of new administrative affairs, and the organization structure has been improved and the facilities have been strengthened. Particularly, according to the FTA-193 Project as presently promoted, the communications network between main SAR organizations where KANWILs are located is expected to be improved. In addition to this, it is possible more surely to command and operate ships belonging to the DGSC, if the communications and information system as proposed in this Study on the Maritime Safety Plan (Long-term Development Plan) is completed.

For this purpose, the most important task of the short-term plan is to centralizedly monitor and control the movements of all ships belonging to the DGSC. In the event of marine accidents, the proper setup should be established so as to intensively mobilize these ships.

Subsequently, the organization for commanding and operating ships should be newly established in the DGSC and KANWILs. If such an organization is under the jurisdiction of the Head of the DGSC and Head of KANWIL, prompt and efficient rescue from marine accidents can be attained, and the DGSC can fully discharge their obligations in the national rescue organization.

In order to accomplish DGSC's mission, the setup for marine disaster prevention, special rescue, harbour traffic control and maritime safety training which requires urgency should be established.

In addition, if the development plan has further been promoted for the future, the setup for coping with new administrative needs should be established. For example, improvement of the organizational system as proposed in the long term development plan should be promoted.

7.1 Operations Office System and Its Related Organization

7.1.1 Establishment of Operations Office

In order to embody the foregoing summary, it is necessary to establish an Operations Office system that enables the unification of KANWILs, SAR functions in local operations units, and SAR facilities for maritime safety rescue ships, maritime safety aircrafts, etc., with general control function in the DGSC.

Therefore, the following Operations Office system is proposed to be organized.

- Establishment of Operations Office in the DGSC
- Establishment of Operations Office in each KANWIL
- Establishment of 24-hour watch group system for SAR in the Port Administrator Office

These Offices and Groups should be under the direct control of the Head of DGSC, Head of KANWIL and Port Administrator, and the Heads of organization related to the Directorate of Sea and Coast Guard act for the authorization of the Head of DGSC and KANWIL, and Port Administrator to manage offices and groups.

Operations Office and groups will take in charge of actual tasks. If other relevant organizations for the maritime safety will participate in this Operations Office system, effect from the establishment of Operations Office are expected. The number of newly employed personnel will be considerably decreased if personnel keeping to watch in each organization are allocated to the newly established offices and groups, and thus it may be easy to establish operations office and groups.

(1) Major Facilities for Operations Office System

(i) Operations Office for the DGSC and KANWILs

Large-sized console for SAR: 10 places

Equipment that enables the use of international distress frequencies (medium-high frequency) and frequency for the exclusive use of VHF (control of transmitting and receiving stations is possible)

Configuration: Operation console
Operation board
Electronic chart

(ii) For operations units where Class I and Class II rescue ships are to be allocated

Medium-sized console for SAR: 15 places

Equipment that enables the use of international distress frequencies (medium-high frequency) and frequency for the exclusive use of VHF

Configuration: Operation console
Operation board

(iii) For operations units where Class III or less rescue ships are to be allocated

Small-sized console for SAR: 29 places

Equipment that enables the use of frequency for the exclusive use of VHF

Configuration: Operation console
Operation board

(2) The following shows the related matters as reference.

- The functions of operations office are described in Tables 10.3.2 and 10.3.6 of the Long-term Plan Report.
- The functions of 24-hour watch group are described in Table 10.3.8 of the Long-term Plan Report.
- The personnel for operations office system are described in Table 7.1 of the Short-term Plan Report.

7.1.2 Establishment of Section Supporting the Operations Office System

It is necessary to establish section supporting the activities of the Operations Office by taking charge of the handling of administrative and legal formalities related to SAR among each Directorate in the DGSC, BASARNAS, the Navy, the Marine Police, FKSD, private and international institutions related to maritime SAR. For this purpose, Planning and Coordinating Section should be established in the KPLP, Sub-Directorate Sea Patrol and SAR.

The following shows the related matters as reference.

- The functions of planning and coordinating section are described in Table 10.3.3 of the Long-term Plan Report.
- The personnel for the planning and coordinating section are described in Table 7.1 of the Short-term Plan Report.

7.2 Reinforcement of Ship Repair and Maintenance Personnel for Maritime Safety Rescue Ships

As the size and performance of maritime safety rescue ships tend to be larger and higher, and the number of such ships is increased, the following administrative personnel should be reinforced in the KPLP, Sub-Directorate Ship Units and Ship Repair Section.

- An administrative member
- Three engineering staff members (hull, equipment and communications)

The following shows the related matter as reference.

- The ship repair and maintenance personnel are described in Table 7.1 of the Short-term Plan Report.

7.3 Marine Disaster Prevention System and Its Organization

A disaster prevention system forming a part of central and district organizations should be established, because various marine disasters (e.g., those occurring on sea and those occurring on land extending to the sea) are apt to affect the nation's economy.

As a short-term policy, a specialized organization which is responsible for performing duties related to administrative measures against marine disasters should be established in the DGSC, and Marine Disaster Prevention Section should be placed in the KPLP, Sub-Directorate Sea Patrol and SAR.

The following shows the related matters as reference.

- The functions of Marine Disaster Prevention Section are described in Table 10.3.3 of the Long-term Plan Report.
- The personnel for the Marine Disaster Prevention Section are described in Table 7.1 of the Short-term Plan Report.

7.4 Special Rescue System and Its Organization

In the event that a marine disaster, including marine accidents and aircraft, occurs in any sea area of Indonesia, special rescue system consisting of groups which have mastered special rescue technology should be established.

For this purpose, Special Rescue Stations should be organized in No. 3 Jurisdiction (Jakarta) and No. 4 Jurisdiction (Surabaya) for a short period, and their operation plan should be made under the direct control of the Head of KANWIL through the Head of the Coast Guard & Sea Patrol Division. The Operations Office should be responsible for operating special rescue teams, and the system should be established in such a way to mobilize to the other jurisdictional sea areas at the request of the other jurisdictions through coordination of the DGSC's Operations Office.

Special Rescue Sub-Section placed in the Sea Patrol & SAR Operations Section of the No. 3 and No. 4 Maritime District Office should support the duties of special rescue teams.

The following shows the related matters as reference.

- The personnel for the Special Rescue Station are described in Table 7.1 of the Short-term Plan Report.

- The functions of Special Rescue Sub-Section are described in Table 10.3.7 of the Long-term Plan Report.
- The personnel for the Special Rescue Sub-Section are described in Table 7.1 of the Short-term Plan Report.

7.5 Harbour Traffic Control System and Its Organization

A Harbour Traffic Control System should be established in the Surabaya Port considering the degree of development of a port, the degree of collision risk, and the importance of the port area, and a Harbour Traffic Control Center should be provided under the operation and control of the Port Administrator.

The following shows the related matters as reference.

- The functions of Harbour Traffic Control Center are described in Table 10.3.8 of the Long-term Plan Report.
- The personnel for the Harbour Traffic Control Center are described in Table 7.1 of the Short-term Plan Report.

7.6 Establishment of the MSTC

An urgent task of the DGSC is to train personnel engaged in maritime safety duties. For this purpose, a Maritime Safety Training Center should be established in Jakarta under the direct control of the Head of DGSC.

The following shows the related matter as reference.

- The personnel for the Maritime Safety Training Center is described in Table 7.1 of the Short-term Plan Report.

7.7 Cost Estimation

		(Unit: Rp. million)
(i)	Large-sized console	899 x 10 places = 8,990
(ii)	Medium-sized console	141 x 15 " = 2,115
(iii)	Small-sized console	97 x 29 " = 2,813
	Total	13,918

Table 7.1 Overall Organization Plan for Maritime Safety and SAR and Newly Required Manpower (Short-term Plan)

Categorized Items of Development Plan	Newly Required Manpower
<p>(i) Establishment of Operations Office System <u>450p</u></p> <p>a. Directorate General of Sea Communication: 28 Operations Office to be established</p> <p>b. KANWIL: 17p x 9 = 153 Regional Operations Office to be established</p> <p>c. Operation Unit: 6p x 44 = 264 24-hour watch group to be established</p> <p>d. Directorate of Sea and Coast Guard: 5 Sub-organization of Planning coordination to be established in Sub-Directorate Sea Patrol and SAR</p>	<p>a. Head, Deputy, 2p x Planning, 3p x Operation, 2p x Information adm., 3p x Information dissemination, 2p x Communications, 2p x PR 3p x Team Leaders, Watchmen 3p x 3 Teams (1p each for Communications)</p> <p>b. Head, Deputy, 2p x Operation, 1p x Information adm., 1p x Information dissemination, 1p x Communications, 1p x PR 3p x Team Leaders, Watchmen 2p x 3 Teams (1p each for Communications)</p> <p>c. 3p x Team Leaders, Watchman 1p x 3 Teams</p> <p>d. Head, 2p x Planning, 2p x Communication & Control</p>
<p>(ii) Development of Rescue Ships and Ships Maintenance System <u>267p</u></p> <p>a. Development of Rescue ships (Reinforcement of KPLP Fleet): 243p x 1.08=263 7 ships (3 x Class I-A, 2 x Class I-B, 2 x Class II)</p> <p>b. Directorate of Sea and Coast Guard: 4 Reinforcement of ships repair and maintenance in manpower for reinforcement of KPLP Fleet</p>	<p>a. Class I-A : 47p x 3 ships = 141p, Crew organization Class I-B : 35p x 2 ships = 70p, (Refer to Table A.7.1 Class II : 16p x 2 ships = 32p, of APPENDIX VII.)</p> <p>b. 1p x Administration, 3p x Engineering</p>
<p>(iii) Establishment of Marine Disaster Prevention System <u>5p</u></p> <p>a. Directorate of Sea and Coast Guard: 5 Sub-organization of Marine Disaster Prevention to be established in Sub-Dit of Sea Patrol & SAR</p>	<p>a. Head, 2p x Planning, 2p x Disaster Prevention</p>
<p>(iv) Establishment of Special Rescue System <u>52p</u></p> <p>a. KANWILs (III. IV.): 23p x 2 = 46 Special Rescue Station to be established</p> <p>b. KANWILs (III. IV.): 3p x 2 = 6 Sub-organization of special rescue to be established in Coast Guard & Sea Patrol Div. Sea Patrol & SAR Operations Section</p>	<p>a. Head, Deputy, 1p x Administration, 4p x Team Leaders, 4 Members x 4 Teams</p> <p>b. 2p x Administration, 1p x Supply Planning</p>
<p>(v) Establishment of Harbour Traffic Control System <u>21p</u></p> <p>a. ADPEL (Surabaya): 21 Harbour Traffic Control Center to be established</p>	<p>a. Head, Deputy, 15p x Operation, 4p x Maintenance</p>
<p>(vi) Establishment of Maritime Safety Training System <u>120p</u></p> <p>a. DGSC (Jakarta): 120 Maritime Safety Training Center to be established</p>	<p>a. Administration Personnel 45p (Principal, 44p x Administration), Training Facilities Development 20p, Maritime Safety Research 5p, Groups of Instructors 50p</p>

Total 915 persons

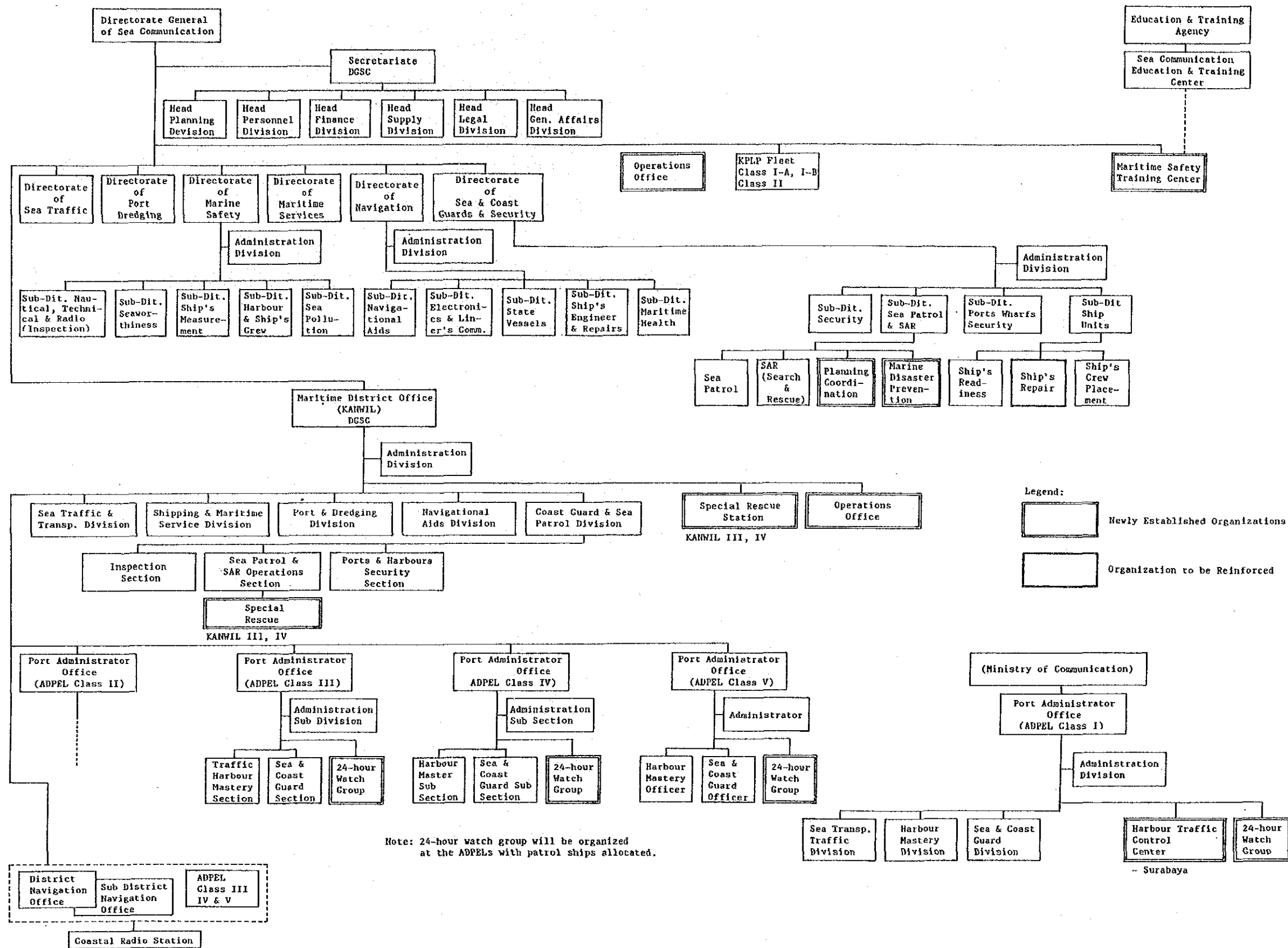


Fig. 7.1 Overall Conceptual Organization for Maritime Safety and SAR (Short-term Plan)

8 Development Plan

8.1 Basic Idea for Development Plan

8.2 Policy and Strategy

8.3 Sea Transport Budget and Maritime Safety Budget

8.4 Conclusion

Section 8 Development Plan

8.1 Basic Idea for Development Plan

Based on the Nusantara Outlook (outlook of the Indonesian archipelago), Indonesia has been devoting itself to the development of its socio-economy and various resources, in order to improve the living standard of its people and increase national prosperity.

However, many lives and properties have been lost every year owing to marine accidents involving general ships, sailing ships and fishing boats because of insufficient maritime safety policy that is included in the framework of national development plans. Sea transport by these ships plays a vital role.

In light of the above situation, this development plan is made, recognizing the "Nusantara Outlook" and the importance of life and property and based on "Philosophy for Maritime Safety in Indonesia", by analysing a trend of the national development plans for future prospects, so as to set up maritime safety measures in harmony with the development of socio-economy and resources, not limited to a natural one.

8.2 Policy and Strategy

In this development plan, which is to be accelerated in the framework of a national development plan, the pivot of establishment for the maritime safety system/framework among policies and strategies of the national development plan should read as follows.

8.2.1 Policy

Establishment of "compact and efficient" maritime system(s) enabling autonomous exploitation in accordance with development stages of the national economy.

(1) Ongoing activities (Carry-over) of Repelita IV (financed with a domestic fund as well as a foreign assistance to make them operational)

(2) Increase of budgets for operation, maintenance and rehabilitation in the scheme of the optimal use of the existing facilities

(3) Increase of new capacity with the priority of:

a) Support of non-oil/gas export by the concrete way, for which an F/S was already reviewed, and design and technical specifications were available.

b) Emphasis of distribution on the provinces of Eastern Indonesia

c) Emphasis on safety of transportation

8.2.2 Strategy

For the target of stability and growth, the following strategies are created to establish a minimal management system by replenishment of systems and equipment exigently required.

- (1) To maximize an effective level of fleet, facility and harbour equipment along with maritime safety
- (2) To fulfil maritime safety regulations as much as possible
- (3) To increase service quality, business productivity and operation
- (4) To expand operation, maintenance and rehabilitation by the maximum utilization of the existing facilities
- (5) To increase the capacity, taking into account the factors mentioned above
- (6) To make human resources professionalized and cadre
- (7) To enhance an external and internal coordination
- (8) To enrich a control system and a constantly operational management

8.3 Sea Transport Budget and Maritime Safety Budget

An annual growth rate of the gross domestic product (GDP) shall be set to be 4% as envisaged in the Socio-Economy, Konsepsi Kebijakan Repelita V Mei 1987 (hereinafter called "Rolling Plan") be fundamental and Kosep Repelita V Sub Sektor Perhubungan Laut Draft Ke III 15 Agustus 1988 (hereinafter called "Draft III") be taken into account as a referential material. Based on these, a budget/fund is set up for this Study as follows.

8.3.1 Budget of a Development Plan in the Sea Transport Sector

By utilizing the figures of Statistik Indonesia 1987 and so forth based on the 4% of GDP growth rate, a development-budget growth of the sea transport sector is figured out as tabulated in Table 12.3.2 of the long-term plan. (Reference is made to 8.2.1, (3) of APPENDIX VIII.)

The development budget is classified into the short and long terms respectively as listed below.

- (1) Short-term Development Budget --- Rp. 1,954.7 billion
- (2) Long-term Development Budget ---- Rp. 8,634.7 billion

8.3.2 Target of the Development Budget in the Sea Transport Sector

In light of the importance on the Nusantara Outlook, the Draft III is schemed out for a target of the budget in the sea transport sector. Its breakdown is clarified as follows.

Table 8.3.1 Total Budget of the Sea Transport Sector (Draft III)

(Unit: Rp. billion)

Program	1989/1990		Repelita V		Total	Per-centage (%)
	National Budget	State-owned(*) Enterprise/Private	National Budget	State-owned(*) Enterprise/Private		
1. Armada (Fleet)	9	299/PM	45	805/PM	850	31
2. Harbour facilities	124	33	701	-	701	25
3. Maritime safety	22	-	694	70	764	28
4. Repair/Maintenance/Rehabilitation	27	-	245	199	444	16
Total	182	332	1,685	1,074	2,759	
Percentage (%)	35% (514)	65%	(61%)	(39%)	100	

Source: Draft III, August 15, 1988

(*) State-owned enterprise: - Perumpel (Public Port Corporation)
- Perum Pengerukan (Public Dredging Corporation)

8.3.3 Maritime Safety Budget in the Budget of Sea Transport Sector

At the stage of this Study, the Rolling Plan is the latest data for the establishment of a maritime safety system as to a budget. Based on the materials, the items relating to the maritime safety in the short term plan of this Study are selected and then their budgets are compared with the whole budget of the sea transport sector as follows.

(1) Total Budget of the Sea Transport Sector

The total budget of the sea transport sector is summarized in Table 8.3.2.

Table 8.3.2 Total Budget of the Sea Transport Sector (Rolling Plan)

(Unit: Rp. billion)

Total & %	Breakdown	Source of Fund			Percentage (%)
		Domestic	Foreign	Total	
Total		485	2,566	3,052	100
Percentage (%)		16	84	100	

Source: Rolling Plan (III-78 Table 3.16)

Reference is made to Table A.8.2 of APPENDIX VIII.

(2) Budget for Maritime Safety

The budgets/funds of the items relating to this Study picked out from the total budget of the sea transport sector amount to Rp. 350.5 billion.

Table 8.3.3 Source of Funds for Items in this Study

(Unit: Rp. billion)

Development Program	Necessaries	Source of Fund			Percentage (%)	Page of Data
		Domestic	Foreign	Total		
Seaworthiness/harbour traffic control	Operational facilities	12.0	4.5	16.5	4.5	III-50
Navigation aid	Maritime telecom. facilities	20.0	103.0	123	36	III-56
Security/law & order/marine law/SAR aids	Ships/SAR equipment & telecom.	51.0	59.0	110	31	III-61
Maritime services/under-water works	Salvage equipment	7.0		7	2	III-66
Sea contamination control	(No specifications)		2.0	2	0.5	-
Maritime sector training	Training facilities		92	92	26	III-75
Total		90	260.5	350.5	100	
Percentage		26	74	100		

Source: Selection from Rolling Plan

(3) Allocation Ratio of the Budget

Compared one with the other in the total, a share of the items (Rp. 350.5 billion) related to the short term plan for maritime safety in this Study occupies 11.48% (11.5%) against the sum of the whole sea transport sector (Rp. 3,052 billion).

- (i) Share of this Study in the sea transport sector ----- 11.5%
- (ii) Ratio of local and foreign funds ----- 16% to 84%

(4) Budget for the Long-term Plan

Based on the aforementioned "Basic Idea for Development Plan" the long term development plan is made for 17 years from 1989 through 2005 in this Study.

From the long-term plan, the items for the short-term plan have been picked up and their amounts are totaled as follows.

Table 8.3.4 Items and Amounts of the Development Plan in this Study

(Unit: Rp. billion)

Item	Amount
a) Maritime Safety Training Center	Rp. 45.7
b) Maritime Safety and SAR	Rp. 173.2
c) Harbour Traffic Control System	Rp. 37.0
d) Maritime Safety SAR Communication and Information System	Rp. 21.5
e) Operations Office	Rp. 13.9
f) SAR Overseas Special Training	Rp. 1.3
Total	Rp. 292.6

(Exchange rate: US\$1 = Rp. 1,670 = ¥130. Thus, Rp. 12.85 = ¥1)

(5) Budgets/Funds for Maritime Safety on Scale

As to the budgets/funds for maritime safety, the totals of the respective development budgets for the sea transport sector are multiplied by the ratio of the short-term plan for maritime safety appropriated in the Rolling Plan. The calculation resulted in the following.

- (i) Maritime Safety Budget in the Short Term Plan of the Sea Transport Sector Rp. 224.8 billion
(The available funds for Repelita V in this study from the data in the past to date)

- (ii) Maritime Safety Budget in the sea transport sector of the Rolling Plan Rp. 351.0 billion
(The 11.5% of the budget for the sea transport sector in the Rolling Plan, May, 1987)

- (iii) Maritime Safety Budget in the target of the development budget in the sea transport sector Rp. 317.3 billion
(The 11.5% of the budget for the sea transport sector in the Repelita V dated 15th Aug., 1988)

However, the investment cost of the short term plan Rp. 292.6 billion

8.4 Conclusion

This development plan is made for Repelita V, out of the programs established from a long-term viewpoint in consideration of the current situations on maritime safety and based on recognizing the "Nusantara Outlook" and the importance of life and property at sea. Since a share of budgets/funds for maritime safety has been observed to be small when compared with those for other fields in the sea transport sector, an arrangement of the maritime safety systems/organizations is regarded as insufficiency. Thus, this fact brings about loss of valuable life and property at sea. In light of the situation, emphasis is placed on training the personnel and replenishing maritime safety rescue ships for the rescue of maritime distress.

Therefore, the budget of the short term plan for the amount of Rp. 292.6 billion is bigger than the amount, Rp. 224.8 billion which has been calculated with the growth rate in the past to date of the sea transport sector, and smaller than the amount targeted in the Rolling Plan.

Table 8.4.1 Investment Schedule for Repelita V

(Unit: Rp. million)

	Investment	1989	1990	1991	1992	1993
Operations Office	13,918					
a. Large Console	8,990			4,495	4,495	
b. Medium Console	2,115			1,058	1,057	
c. Small Console	2,813			1,407	1,406	
Maritime Safety Rescue Ships & Rescue System	154,692					
a. Maritime Safety Rescue Ships	154,200					
Class I-A	92,520			30,840	30,840	30,840
Class I-B	46,260	23,130	23,130			
Class II	15,420				7,710	7,710
b. Moorage Piers	492					
Class I-A	322			108	107	107
Class I-B	170	85	85			
Disaster Prevention Units	10,665			10,665		
Special Rescue Team	7,848		3,924	3,924		
Maritime SAR Communication and Information System	21,460					
a. SAR Telecommunication EPIRB	12,722			3,855	3,855	5,012
b. Command Control Communication System MES	8,738			2,913	2,913	2,913
Harbour Traffic Control Center						
a. Surabaya	37,021	18,511	18,511			
SAR Overseas Training	1,284	1,284				
Maritime Safety Training Center	45,700					
a. Building	20,600	10,300	10,300			
b. Facility	9,100		4,550	4,550		
c. Materials	16,000		8,000	8,000		
Total Investment	292,588	53,310	68,499	71,815	52,382	46,582

9 Economic Evaluation

- 9.1 Method of Economic Benefit Calculation**
- 9.2 Analysis of Damages by Accident**
- 9.3 Estimation of Accidents to be Rescued**
- 9.4 Economic Benefit**
- 9.5 Economic Evaluation of Major Projects**

Section 9 Economic Evaluation

When economic evaluation is made for the Study of the Maritime Safety Plan Concerning Search and Rescue, effects from implementation of short- and long-term development plan for the maritime safety system should be grasped in detail in harmony with socio-economic and resources development, based on the philosophy for the maritime safety, for comparative study of investment and effects and for securing effective and safe routes for sea transportation and other safe maritime activities.

Marine transport in Indonesia plays a vital role in transporting commodities as necessities for the Indonesian people in the archipelago nation consisting of numerous islands. However, many lives and properties have been lost every year owing to marine accidents involving general ships, sailing ships and fishing boats because of insufficient maritime safety policy. Therefore, the situation of lost lives and properties should be analyzed.

In view of this, forecast of marine accidents and estimation of their damage should be made, and effects from the improvement of the maritime safety system (effects from maritime safety rescue) should be precisely estimated for comprehensive evaluation. Data obtained in Indonesia are fundamentally used for evaluation. However, relevant data from Japan Maritime Safety Agency are supplementarily used as a reference if data have not been processed well.

9.1 Method of Economic Benefit Calculation

A flow for calculating direct damage reduction value is shown in Fig. 9.1.1. The study area will be classified into three areas of port, strait and sea. The condition of each accident, present facilities or personnel will be analyzed according to places of sea area, and then, future plan for facilities and organizational system will be formulated.

On the contrary, accidents will be analyzed for each damage item and damage volume and accident category, and then economic value by damage item and damage ratio will be calculated to obtain damage value per accident by multiplying them. Next, facilities corresponding to each category of accident will be classified and rescue ratio and damage reduction ratio will be set according to the future operation plan.

As a result, it is possible to take effective measures to cope with accidents occurring in the future; damage will be decreased if lives, hull parts and the like are rescued, and rescue time are decreased through reinforcement of facilities.

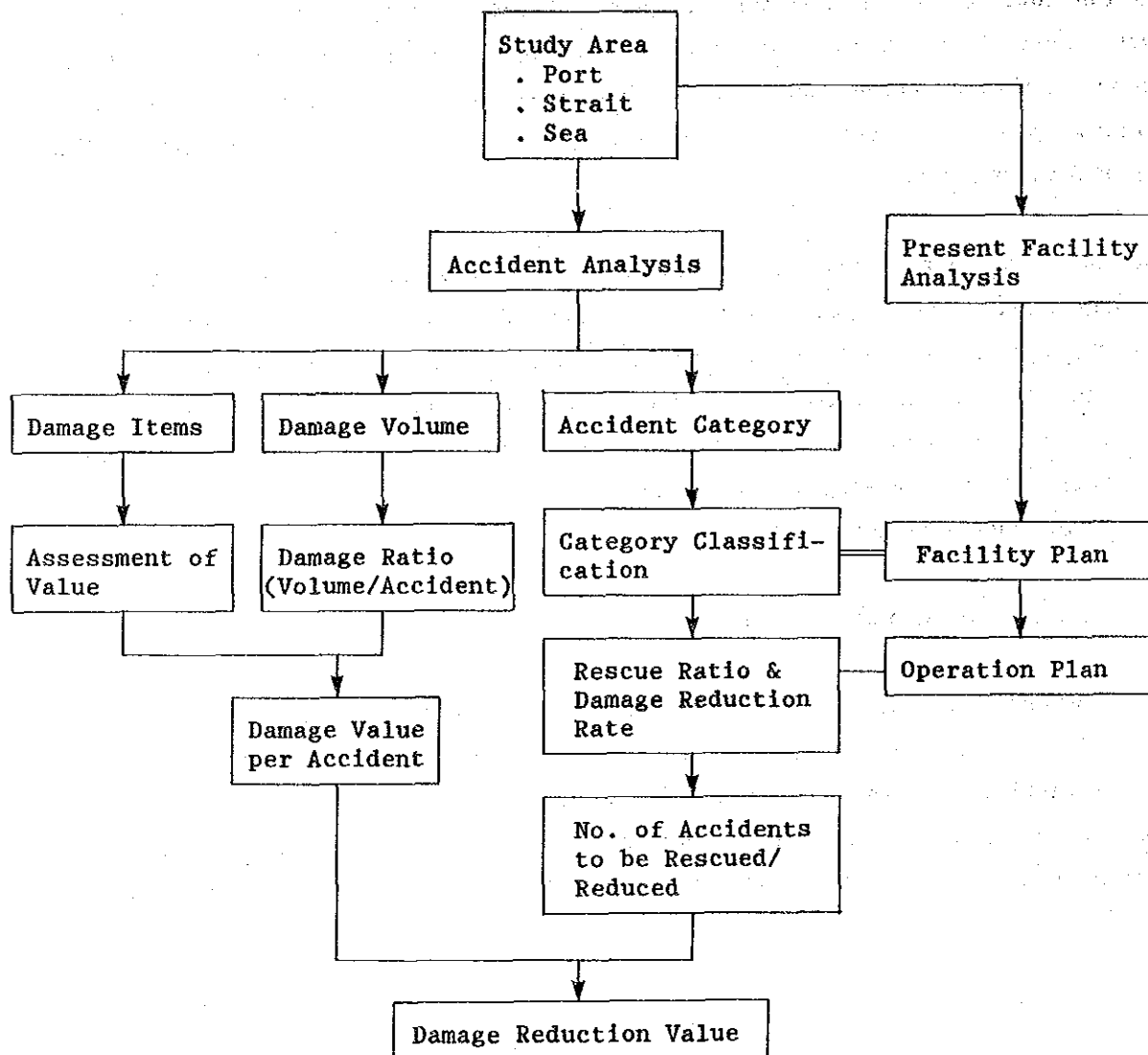


Fig. 9.1.1 Flow of Economic Benefit Calculation

9.2 Analysis of Damages by Accident

Results analyzed concerning 1,781 marine accidents that occurred throughout the sea area in Indonesia for the five years from 1982 to 1986 (according to DGSC Log Book) are summarized below.

9.2.1 Assessment of Value

Damage items should be limited to human beings, ship hull and cargo. Their assessed value are as follows:

(1) Human Beings

Accidents entail death, missing or injured persons. Human beings are traded in the commercial market as a human resource which is priced for their services provided, and reduced service by death/injury is appropriated in the amount.

Human beings to be covered are classified into seaman (crew) and passenger. As a method of estimating the economic value for human beings, the most commonly used way is to forecast the total net income which deducts required expenses from their gross income over economic life period and to find the discounted present value of the total net income. Estimated results are shown in Table 9.2.2 and data applied for the estimation are shown in Table 9.2.1.

(2) Ship Hull

It is difficult to set up the ship price, but depending on the size, type and age of ship. Since already depreciated and old ships predominate in Indonesia, it is also difficult to evaluate actual ship price. Therefore, assessed value of ships is considered as the sum of expected profits which are brought every year. Expected benefits returned to the present value by discounting expected profits for the future are considered to be the ship value. Estimated results are shown in Table 9.2.2 and data applied for the estimation are shown in Table 9.2.1.

(3) Cargo

Import and export data 11 years concerning the price of cargo are compiled in Table 9.2.3. From this table, the price of cargo for the future is considered to decrease. Here, the analysis is made in the assumption that the future and present prices do not change. The price of domestic cargo is considered to be the same level as import and export, and annual cargo amount per ship's DWT is shown in Table 9.2.1. Shipping companies by shipping service are described in this table, and these items to be applied for benefit calculation are estimated from the average ship size based on accidents data.

Table 9.2.1 Shipping Companies Data in 1985

(Unit: Rp. million)

	Ocean- going	Inter- island	Local	Special	Traditional
Crew/Ship	56.8	23.1	2.1	13.0	1.5
Wage/Crew	4.64	1.65	0.77	4.24	0.81
Gross Profit	138830	121451	15836	304094	7198
Operating Ratio	0.67	0.62	0.69	0.65	0.67
Ship, 1984 : Unit	58	398	1220	2669	3807
: DWT (BRT)	832430	500661	186021	6189684	318832
: DWT(BRT)/Unit	14354	1258	152	2319	84
Output/Ship	7176	805	41	326	6
Output/DWT	0.50	0.64	0.27	0.14	0.07
Profit/Ship	2394	305	13	114	2
Profit/DWT	0.17	0.24	0.09	0.05	0.02

Source: Economic Census 1986, BPS
Statistical Yearbook of Indonesia 1986, BPS

Table 9.2.2 Estimation of Value per Unit

(Unit: Rp. million)

	Ocean- going	Inter- island	Local	Special	Traditional
Human Value	21.12	7.07	2.73	17.35	3.11
Ship Value	17,098.35	2,178.36	92.85	814.21	14.28

Table 9.2.3 Export/Import Value per kg in Indonesia

Year	Export Mil.kg	Export Mil.US\$	Export US\$/kg	Import Mil.kg	Import Mil. US\$	Import US\$/kg	Ex & Im US\$/kg
1976	83,722.3	8,546.5	0.10	5,678.3	758.3	0.13	0.10
1977	95,302.4	10,852.6	0.11	8,530.8	1,154.9	0.14	0.12
1978	101,267.2	11,643.2	0.11	10,529.4	1,477.9	0.14	0.12
1979	98,268.0	15,590.1	0.16	11,236.7	2,232.5	0.20	0.16
1980	101,414.8	23,950.4	0.24	14,767.1	3,264.9	0.22	0.23
1981	97,353.1	25,164.5	0.26	15,829.3	3,414.8	0.22	0.25
1982	98,456.4	22,328.3	0.23	29,466.6	3,499.1	0.12	0.20
1983	104,653.9	21,145.9	0.20	33,622.9	3,476.4	0.10	0.18
1984	105,880.4	21,887.8	0.21	28,026.7	2,487.3	0.09	0.18
1985	132,035.7	18,586.7	0.14	65,542.7	1,987.6	0.03	0.10
1986	148,094.0	14,805.0	0.10	70,910.5	1,526.9	0.02	0.07

Source: Statistical Yearbook of Indonesia, 1986, BPS

9.2.2 Damage Ratio

Damage ratio by category of accident and place totaled 771. The breakdown of the total number into port, strait and sea are summarized in Table 9.2.4. In this table, the number of damage to human lives and cargo is calculated per one accident. In other words, 163 accidents occurred in straits; the number of human beings per accident was 0.63 and cargo per accident was 70 ton. In sea areas, 444 accidents occurred; the number of human beings and cargo per accident was 0.66 and 44, respectively. Since these ratio would not be considered to change greatly towards the future, these ratios are assumed not to change in the study.

Table 9.2.4 Summary of Damage Ratio by Category and Place
(1982-86)

	Total Port		Total Strait		Total Sea		Grand Total				
	No.	Human Cargo	No.	Human Cargo	No.	Human Cargo	No.	Human Cargo			
Sunk	55	0.02	97	0.27	40	247	0.48	54	395	0.36	57
Flooding	7	0.00	41	0.57	123	28	1.18	25	42	0.88	44
Stranding	11	0.00	26	0.00	34	24	0.04	54	39	0.03	44
Engine Trouble	0	0.00	0	0.25	17	9	0.56	36	13	0.46	30
Capsizing	4	0.00	12	2.00	15	11	6.36	20	21	3.90	17
Collision	39	0.05	3	0.00	46	49	0.18	3	102	0.11	9
Drifting	1	0.00	0	0.60	936	9	0.78	36	15	0.67	334
Fire	20	0.30	18	1.13	85	16	1.31	31	44	0.82	35
Human Loss	24	0.25	0	3.43	0	36	0.33	17	74	0.89	8
Others	3	0.00	1	0.13	56	15	1.13	122	26	0.69	88
Total	164	0.09	39	0.63	70	444	0.66	44	771	0.53	48

Source: DGSC Log Book

9.3 Estimation of Accidents to be Rescued

9.3.1 Rescue Ratio

DGSC/KPLP do not participate in all rescue activities. Fig. 9.3.1 shows rescue activities in which DGSC/KPLP participate or do not participate. More specifically ships in distress are rescued by DGSC/KPLP or are returned to a port by oneself without any rescue assistance.

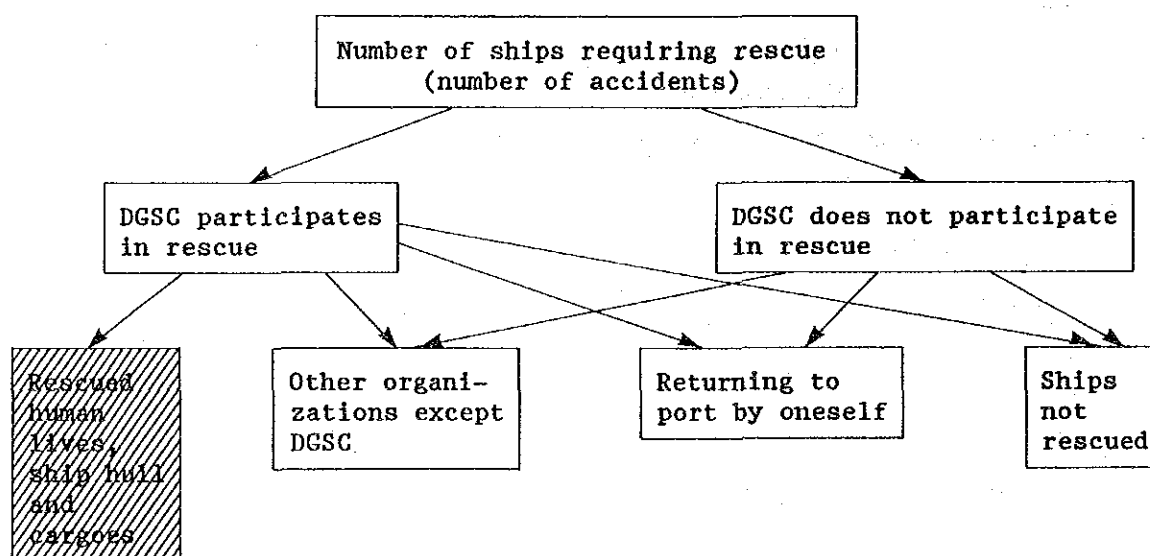


Fig. 9.3.1 Ships to be Rescued

Since abnormal meteorological phenomena do not develop in Indonesia and the seawater's temperature is high in the sea area of Indonesia, rescue ratio can be the same as the rate as shown in Table 9.3.1 (the Japan Maritime Safety Agency's data) if the always ready system is established in marine accident-prone sea areas. In other sea areas, the always ready system should be established according to the number and performance of fleet allocated, and rescue ratio should be calculated.

9.3.2 Damage Reduction Rate

There are two kinds of damage reduction; one is the number of accidents itself and the other is damage value of accidents (damage value x damage rate).

As for the number of accidents, the purpose of harbour traffic control system is to prevent accidents, and this system will directly lead to reduced number of accidents. On the other hand, other facilities will not directly decrease the number of accidents, but will decrease the damage value, because they are used for rescue activities. In other words, if the amount of rescue activities is assumed to be a function of the number of facilities and their operating efficiency, the damage reduction rate is considered to be in direct proportion to the amount of rescue activities. The setting of this rate means nothing only when the present facilities in Indonesia are at the lowest level; achievements of rescue are nearly zero. Therefore, this rate should be setup by finding some relationship between each facility and category of accidents and understanding as to in which sea area the always ready system will be established. If the always ready system is established, rescue activities could perfectly be performed and damage is assumed to decrease to 100%.

(1) The always Ready System

As the always ready system, Class I and Class II ships will be allocated in marine accident-prone sea area within 100 NM radius of bases. The number of days that one ship should patrol on sea is 180 days/year.

Table 9.3.1 Rescue Ratio during Establishment of the always Ready System

	Return by Oneself (%)	Rescued (%)	Ships not Rescued (%)
Collision	35	45	20
Stranding	5	75	20
Capsizing	0	55	45
Fire	20	30	50
Flooding	10	90	0
Sunk	0	50	50
Engine Trouble	5	94	1
Human Missing	30	25	45
	0	0	100

Source: Japan Maritime Safety Agency

Note: High percentage of rescue ratio is based on the conception that multi-functional performance as well as salvage capability should be provided on maritime safety rescue ships, and maritime safety rescue activities should be performed as a duty of the country.

Sea water area to be covered in Phase I is shown in Fig. A.3.1 of APPENDIX III.

(2) The 180-day Ready System

As the 180-day ready system in other sea area, fleets allocated in each KANWIL except those in (1) as mentioned above will be allocated. Small fleets will keep watch on around bases as shown in Fig. A.3.1 of APPENDIX III. The number of days that one ship should patrol on sea is 180 days/year.

Table 9.3.2 Rescue Ratio during Establishment of the 180-day Ready System

	Return by Oneself (%)	Rescued (%)	Ships not Rescued (%)
Collision	35	23	42
Stranding	5	38	57
Capsizing	0	28	72
Fire	20	15	65
Flooding	10	45	45
Sunk	0	25	75
Engine Trouble	5	47	48
Human	30	13	57
Missing	0	0	100

Source: Japan Maritime Safety Agency

(3) Ports and their Neighbourhood

The rescue ratio of marine accidents occurring in and around ports where small fleet are to be allocated is considered to be the same as that of the always ready system. Ports, their neighbourhood and offshore area where fleet are not allocated are considered as "Ships not Rescued".

(4) Surabaya Port

Damage to ship hull caused by collision, and stranding accidents (i.e., damage value) within the Surabaya Port should be 20% and 50% of ship value respectively which should be lower than that of the outside of the port.

9.3.3 Number of Accidents to be Rescued

Reduced number of accidents is calculated by setting up the reduction rate according to operation plan based on estimation of the number of accidents and facilities plan.

The number of accidents by the year 2005 is estimated by category of accident, but that by location is not estimated. Therefore, it is assumed that according to data of 771 accidents ascertained from 1982 to 1986 share by location is the same as that in 2005, as shown in Table 9.3.3. As a result, the number of accidents in port, strait and sea area is 123, 92 and 276 respectively.

The number of accidents is estimated as shown in Table 9.3.4 by applying rescue ratio and damage reduction rate with these figures.

The number of accidents by year is shown in Fig. 9.3.2. In other words,

- 1) Estimated accidents will be rescued in facilities planned in the future.
- 2) Phase I project covers the number of accidents from the year 1994.
- 3) In the long-term plan, the number of accidents from the year 2005 is assumed to be covered and the increasing rescue ratio will lead to increasing number of accidents to be rescued to a certain extent due to the efficiency of operation system.

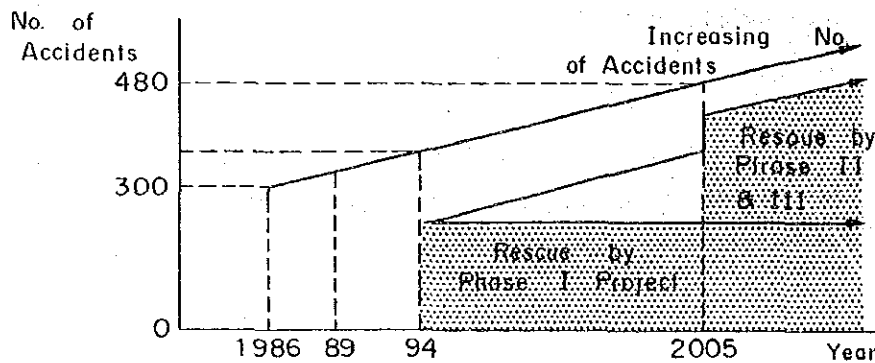


Fig. 9.3.2 Number of Accidents to be Rescued

Table 9.3.3 Damage Volume by Category and Place in 1994 and 2005

	Total Actual No. (1982-86)				Share (%)				Estimated No. in 1994				Estimated No. in 2005			
	Port	Strait	Sea	Total	Port	Strait	Sea	Total	Port	Strait	Sea	Total	Port	Strait	Sea	Total
Sunk	55	93	247	395	14	24	63	100	12	20	53	85	13	23	60	96
Flooding	7	7	28	42	17	17	67	100	5	5	20	30	6	6	23	34
Stranding	11	4	24	39	28	10	62	100	10	4	21	35	11	4	24	39
Engine Trouble	0	4	9	13	0	31	69	100	0	11	25	36	0	13	28	41
Capasized	4	6	11	21	19	29	52	100	2	2	5	9	2	3	5	10
Collision	39	14	49	102	38	14	48	100	27	10	33	70	61	22	77	160
Drifting	1	5	9	15	7	33	60	100	1	3	5	9	1	3	6	10
Fire	20	8	16	44	45	18	36	100	9	4	7	21	10	4	8	23
Human Loss	24	14	36	74	32	19	49	100	15	9	23	47	17	10	26	53
Others	3	8	15	26	12	31	58	100	1	4	7	12	2	4	8	14
Total	164	163	444	771	21	21	58	100	81	71	200	352	123	92	276	480

Source: DGSC Log Book

Table 9.3.4 Number of Accidents to be Rescued

	1994			2005	
	Strait	Sea	Port	Strait	Sea
Sunk	7	17	7	11	30
Flooding	3	12	5	5	20
Stranding	2	10	8	3	18
Engine Trouble	7	15	0	12	27
Capsized	1	2	1	2	3
Collision	3	10	28	10	35
Drifting	1	2	0	2	3
Fire	1	1	3	1	3
Human Loss	2	4	4	3	6
Others	0	0	0	0	0
Total	27	73	56	48	145

9.4 Economic Benefit

9.4.1 Maritime Safety Rescue System (Phase I) Project

Damage reduction value calculated according to process as explained previously is summarized in Table 9.4.1.

Table 9.4.1 Damage Reduction Value

(Unit: Rp. million)

	1994			2005	
	Strait	Sea	Port	Strait	Sea
Sunk	702	1,784	420	1,136	3,108
Flooding	366	1,189	272	588	2,055
Stranding	4,096	22,891	9,020	6,551	39,372
Engine Trouble	704	1,532	0	1,145	2,685
Capsized	98	191	51	160	332
Collision	6,644	21,587	12,014	21,600	75,396
Drifting	257	173	16	419	304
Fire	87	148	158	139	256
Human Loss	38	19	8	60	33
Others	0	0	0	0	0
Total	12,992	49,514	21,958	31,798	123,542

In 1994 in which Phase I project is completed, direct reduction value in strait and sea area is Rp. 13 billion and Rp. 49.5 billion respectively, and total of these is Rp. 62.5 billion.

At the time of completion of the Long-term Plan in which Phases II and III will be implemented, it is estimated that the damage reduction in port, strait and sea area is Rp. 22 billion, Rp. 31.8 billion and Rp. 123.5 billion, respectively, and total value is Rp. 177.3 billion.

9.4.2 Surabaya Harbour Traffic Control System Project

Number of accidents to be rescued for 20 years from 1991 to 2010 is estimated to be 163. If this estimated number of accidents is considered to be prevented by this project, benefits will amount to Rp. 80.5 billion.

	<u>No. of Accidents</u>		<u>Value</u>
	1982-86	1991-2010	(Rp. million)
Collision	13	149	65,238
Stranding	3	14	15,307
Total	16	163	80,546

9.5 Economic Evaluation of Major Projects

9.5.1 Maritime Safety Training Center Project

(1) Purpose

The purpose of this Project is to promote securing and cultivation of personnel that precisely perform administrative affairs of the DGSC according to the philosophy for the maritime safety in such a way to cope with diversified situation of the society and changing marine environment, and promote training of newly employed personnel, re-training of the present personnel, training of special technology (e.g., maritime safety rescue) and R&D of this special technology and methodology.

(2) Implementing Body : DGSC

(3) Construction Period: 1989 - 1992

(4) Expected Economic Effects

If the maritime safety training center is established, knowledge and skill in fields of marine affairs, maritime safety rescue, communications and aids to navigation will be improved, and speedy and precise management related to maritime safety rescue is expected.

In the special technical training for maritime safety rescue and R&D of rescue technology, maritime safety rescue technology (flooding, capsized, sunk and so on) will be developed and improved. As a result, more higher level of knowledge and skill will be effectively utilized for maritime safety activities, and rescue ratio of human lives and properties related to marine accidents is expected to increase. Therefore, technical knowledge and skill as required in the Maritime Safety Rescue System Project and Harbour Traffic Control Project will be acquired in this Project.

9.5.2 Maritime Safety Rescue System (Phase I) Project

(1) Brief Description of this Project

- 1) Purpose : Speedy and precise collection of maritime accidents information and conduct of SAR activities. In Phase I, SAR forces and information communications facilities will be improved mainly in marine accident-prone sea area.
- 2) Implementing body : DGSC/KPLP
- 3) Construction duration : 1989-1993
- 4) Expected economic effects : Increasing rescue ratio through establishment of the always ready system for marine accidents
: Preventive effect against marine accidents

(2) Estimation of Operation and Maintenance (O&M) Cost

Costs required for operation of facilities each year are broadly divided into personnel and material costs.

1) Personnel cost

Personnel cost can be calculated as follows:

$$\text{Personnel cost} = (\text{number of personnel required for operation}) \times (\text{their income})$$

The number of personnel required is described in Section 7. According to a hearing survey conducted in Indonesia, per capita income is assumed to be Rp. two million per year at the price of 1988. Its real growth rate during the project life is assumed to be 4% annually, which is the same as the growth rate of GDP. (Refer to Table 9.5.1)

Table 9.5.1 Personnel Cost

(Unit: Rp. million)

Item	Number of Personnel	Personnel Cost
Operations Office	450	900
Maritime Safety Rescue Ship	267	534
Disaster Prevention	5	10
Special Rescue Teams	52	104
Total	774	1,548

2) Material cost

Material costs include costs necessary for fleet (e.g., fuel cost, maintenance cost and so on), cost for personnel and cost other than fleet. Based on Class II costs as estimated in KPLP, costs for Class I-A and Class I-B are estimated. Two percent of the investment amount is earmarked as office expense for operations office. Material costs of disaster prevention are not necessary. (Refer to Table 9.5.2)

Table 9.5.2 Material Cost

(Unit: Rp. million)

Item	Fuel Cost	Maintenance Cost	Miscellaneous	Total
Class I-A	2,265	964	323	3,552
I-B	1,113	308	142	1,563
II	795	232	103	1,130
Operations Office	-	-	-	278
Special Rescue Teams	-	-	-	699

(3) Economic Evaluation

Economic evaluation is made under the following assumptive conditions.

- a) Benefit is only the reduction of the direct damage.
- b) The number of ships to be rescued will be decreased through establishment of the always ready system.
- c) Rescue ratio performed by DGSC/KPLP is considered according to category of accidents.
- d) Facilities cost is calculated on a masterplan level (not detailed estimation), and no conversion is made to the economic cost necessary for the economic evaluation. Costs of estimated facilities are considered to be measured by economic price in which such transfer items as tax, subsidy and so on are not included.
- e) The benefit generates for 20 years starting from 1994 (after completion of investment in facilities and establishment of maritime safety rescue system).

As shown in Table 9.5.3, an Economic Internal Rate of Return (EIRR) is calculated as 14%. Benefit/cost ratio is 1.37 on condition that the discount rate is 10% and total benefit is Rp. 6.079 billion and benefit cost ratio is 4.9; higher economic effects are expected.

9.5.3 Surabaya Harbour Traffic Control System Project

(1) Brief Description of this Project

- 1) Purpose : Traffic control in Surabaya Port
- 2) Implementing body : ADPEL
- 3) Construction duration : 1989-1990
- 4) Expected economic effects : Decrease in number of accidents by collision and stranding
Higher efficiency of pilotage services
Efficient port/harbour activities

(2) Estimation of O&M Cost

1) Personnel cost

The number of personnel required for operation of facilities is 21. On assumption that per capita income is Rp. 2 million, required personnel cost is Rp. 42 million/year (at the price of 1988). Growth rate of GDP is 4%, and therefore incomes are considered to increase.

2) Material cost

Material cost includes electric charges necessary for O&M of machinery and equipment, and repair cost. It also include all amounts expended for maintenance of buildings and facilities. Since there is no harbour traffic control system in Indonesia, data on this system were not available. Therefore, about two percent of investment cost in equipment is earmarked as yearly maintenance cost derived from the past experience in Communications Facility Projects, and therefore this percent will be used in this study.

(3) Economic Evaluation

Assumptive conditions are as follows:

- a) Benefit is only the reduction of the direct accidents.
- b) Accidents by collision and stranding will be perfectly prevented through construction and operation of harbour traffic control center.
- c) Ship values are assumed to be 20% of the total in collision and 50% in stranding accident.
- d) Facilities costs are measured in terms of economic price.
- e) The benefits are assumed to generate during 20 years starting from 1991 when the above center is operated.

As shown in Table 9.5.4, EIRR is calculated as 5% and 1.7 of cost benefit ratio. The obtained low value of EIRR means the low priority given to the project. A further study should be required to obtain the results more precisely because of many assumptions made for the analysis.

Introduction of the traffic control system will play a vital role in enhancing pilotage services efficiently. If the above system is established in Surabaya, ship calls information will be controlled in the above center as a relay station, pilot plans will be effectively made, and pilotage activities will be improved.

Presently, the need of traffic control for shipping route and anchorage area becomes pressing in Surabaya Port. Especially, Tg.Perak Port has a development plan for containerization, and thereby more efficient ship movement should be controlled urgently as these port activities vitalize for the future. In addition, the traffic center can be used for other application, (e.g., monitoring of land facilities), which will have great benefit on the presently damaged facilities.

Table 9.5.3 Economic Evaluation of Maritime Safety Rescue System (Phase I) Project

(Unit: Rp. million)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
I Benefit						62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506	62506
II O & M Cost				4352	19459	19534	19613	19694	19779	19867	19959	20054	20153	20256	20363	20475	20591	20711	20837	20967	21103	21244	21391	21544	21702
1) Personnel Cost				122	1883	1959	2037	2119	2203	2291	2383	2478	2578	2681	2788	2899	3015	3136	3261	3392	3528	3669	3815	3968	4127
a. Operations Office					1095	1139	1184	1232	1281	1332	1386	1441	1499	1559	1621	1686	1753	1823	1896	1972	2051	2133	2218	2307	2399
b. Ship Crew					650	676	703	731	760	790	822	855	889	925	962	1000	1040	1082	1125	1170	1217	1266	1316	1369	1424
c. Disaster Prevention					12	13	13	14	14	15	15	16	17	17	18	19	19	20	21	22	23	24	25	26	27
d. Special Rescue Team				122	127	132	137	142	148	154	160	167	173	180	187	195	203	211	219	228	237	246	256	267	277
2) Material Cost				4230	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576	17576
a. Rescue Ship				3126	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042	16042
b. Operations Office				278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278
c. Special Rescue Team				699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699
d. SAR Communication					429	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429
e. Training				127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127
III Facility Investment	23215	27139	59265	52383	46582																				
1) Operations Office			6960	6958																					
2) Rescue Ship	23215	23215	30948	38657	38657																				
3) Disaster Prevention			10665																						
4) Special Rescue Team		3924																							
5) SAR Communications			6768	6768	7925																				
IV Net Benefit	-23215	-27139	-59265	-56735	-66041	42972	42893	42812	42727	42639	42547	42452	42353	42250	42143	42031	41915	41795	41669	41539	41403	41262	41115	40962	40804

Total Benefit =	607886
E.I.R.R =	13.7%
Benefit/Cost Ratio =	4.9
Discounted Benefit/Cost Ratio =	1.37

Table 9.5.4 Economic Evaluation of Surabaya Harbour Traffic Control System Project

(Unit: Rp. million)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
I. Benefit			2281	2399	2525	2660	2803	2957	3120	3295	3481	3680	3892	4119	4361	4620	4896	5191	5506	5843	6203	6588
II. O&M Cost			788	790	792	794	796	798	800	803	805	808	810	813	816	819	822	826	829	832	836	840
1) Personnel Cost			47	49	51	53	55	57	60	62	65	67	70	73	76	79	82	85	88	92	96	100
2) Material Cost			740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740
III. Facility Investment	18511	18510																				
IV. Net Benefit (I-II-III)	-18511	-18510	1493	1610	1734	1866	2008	2159	2320	2492	2676	2872	3082	3306	3545	3801	4074	4366	4678	5011	5367	5748

Total Benefit =	27184
E.I.R.R =	4.5%
Benefit/Cost Ratio =	1.7
Discounted Benefit/Cost Ratio =	0.57

APPENDICES

APPENDIX I

(Section 1 Introduction)

1.2 Organization of the Study

1.2.1 Composition of the Field Survey Groups

The composition of the field survey groups is shown in Table A.1.1.

Table A.1.1 Composition of the Field Survey Groups
(Phase II; Jul.-Sept., 1988)

Group 1		
	Study Team	Mr. I. Yoshino Mr. H. Manabe Mr. H. Saito
	Counterpart	Mr. T. Sinambela Mr. Yudistar
Group 2		
	Study Team	Mr. T. Onda Mr. T. Noma Mr. T. Suzuki
	Advisory Committee	
	Counterpart	Mr. H. Supit Mr. C. Soetikno
Group 3		
	Study Team	Mr. T. Chiba
	Advisory Committee	Mr. S. Teramoto
	Counterpart	Mr. E. Simandjuntak
Group 4		
	Study Team	Mr. K. Watano
	Advisory Committee	Mr. M. Yokoyama
	Counterpart	Mr. H. M. J. Lumentah
Group 5		
	Study Team	Mr. S. Tokieda Mr. K. Naohara Mr. A. Kobayashi
	Advisory Committee	
	Counterpart	Mr. Paath Mr. H. F. Nelwan
Group 6		
	Study Team	Mr. M. Danno
	Counterpart	Mr. H. Pangaribuan
Group 7		
	Study Team	Mr. M. Sakamoto

1.2.2 Itinerary of the Field Surveys (Phase II)

(1) Phase II Survey

The field surveys were carried out by seven groups from 25th July to 8th September, 1988. Study team and Indonesian counterpart personnel discussed the Interim Report.

- Group 1 carried out field survey in Jakarta and Surabaya.
- Group 2 carried out field survey in Jakarta, Surabaya and Ujung Pandang.
- Group 3 carried out field survey in Jakarta, Semarang and Ujung Pandang.
- Group 4 carried out field survey in Jakarta, Surabaya, Ujung Pandang and Menado.
- Group 5, 6 carried out field survey in Jakarta and Surabaya.
- Group 7 carried out field survey in Jakarta.

(2) Submission of and Discussion on Draft Final Report

The study team submitted the Draft Final Report to the Indonesian counterpart personnel to hold discussions with them in Jakarta from 1st to 14th December, 1988.

APPENDIX II

(Section 2 Background of Short-term Plan)

2.1 Philosophy for Maritime Safety

On the occasion of newly establishing a maritime safety development plan concerning Search and Rescue (SAR) for Repelita V, it is advisable to look back again into the philosophy for Maritime Safety which has been regarded as a basic concept and/or idea and deemed suitable for the situations in the Republic of Indonesia relating to Maritime Safety concerning SAR.

It is natural that the philosophy should be derived from God will, based on PANCASILA and then classified into the main three categories according to the important Laws such as "Shipping Law 1936/TZMKO-1939", "Law No.4 (Prp) 1960 regarding the Sea of Indonesia" and "Law No.20/1982 regarding Defense & Security" which maintain a close relation between them. The categories are referred to as "Economy", "Safety maritime" and "Sovereignty and law principle" slightly overlapping one the other adjoining in their activities and lead to the fleets; Merchant fleet, Government fleet of Maritime safety and Navy fleet.

The must is to recognize for Maritime Safety how important a maritime safety fleet is, occupying a position between a merchant fleet for economy and a navy fleet for defense and security. The three columns of the philosophy have legitimately been strengthened to be reasonable for the situations as aforementioned. The following flow chart (obtained from KPLP) of the philosophy is self-explanatory.

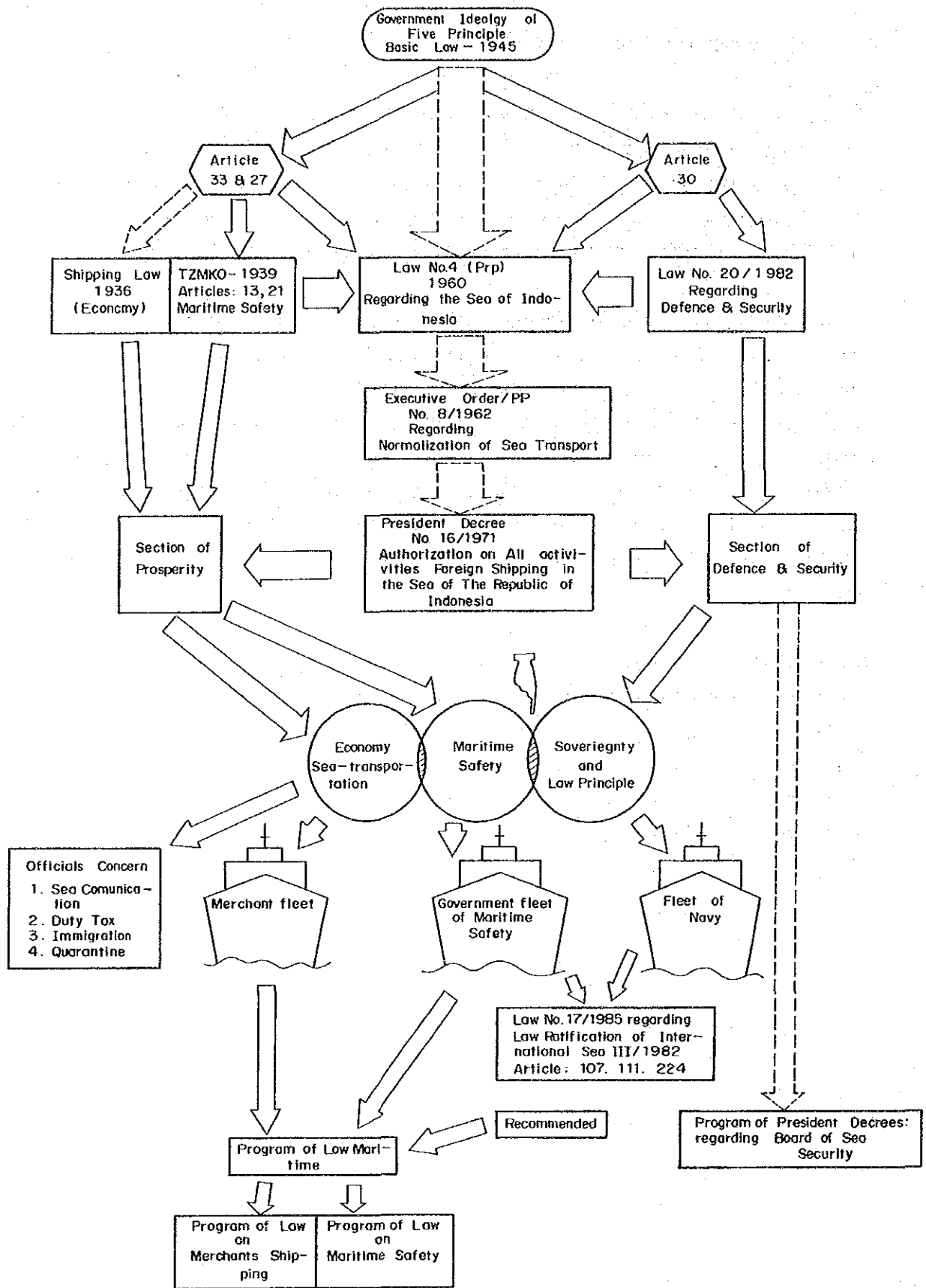


Fig. A.2.1 Flow Chart of Philosophy

Table A.2.1 International Shipping Fleet by Service (1984)

Item Kind	Number of Ships	Tonnage (DWT)	Amount of Cargo (Tons)
General Serv.	58	832,530	19,379,451
Special Serv.	88	688,617	112,850,440
Total	146	1,521,147	132,239,891

Source: DGSC Data

Table A.2.2 Domestic Shipping Fleet by Service (1984)

Item Kind	Number of Ships	Tonnage (DWT)	Cargo	
			Amount (1,000 tons)	%
Regular Liner	398	500,661	7,252	9.2
Local Serv.	1,220	186,021	2,521	3.2
Traditional	3,807	318,832	2,493	3.2
Pioneer Serv.	26	12,210	66,334	84.4
Special Serv.	2,669	6,189,684		
Total	8,120	7,207,408	78,600	100

Source: DGSC Data

Table A.2.3 Fishing Activities in Major Islands (1984)

Island	Item	Number of Fishing Boats			Fishery Production (Tons)	Production Price (Rp. Mill.)
		Total	Motorized	Nonpower		
Sumatra		68,034	27,156	40,878	516,591	218,894
Jawa		63,088	31,513	31,575	435,963	194,862
Bali, Nusatenggara, Timor Timar		36,674	7,388	29,286	133,058	42,251
Kalimantan		22,004	12,278	9,726	165,870	85,404
Sulawesi		81,185	13,287	67,898	334,044	132,564
Maluku, Irian Jawa		42,655	2,089	40,566	127,278	65,918
Total		313,640	93,711	219,929	1,712,804	739,893

Source: Statistical Yearbook of Indonesia, 1986

Table A.2.4 Number of Marine Accidents by Kind and Category of Ship (1982-86)

Kind	Type	Cargo	Tanker	Passenger Ship	Tug-boat	Barge	Fishing Vessel	Pleasure Boat	Motor Ship	Motorized Sailing Ship	Sailing Ship	Unknown Others	Total
Collision		74	22	5	28	5	19	4	71	21		17	266
Stranding		49	15	3	10	6	15		60	51	1	16	226
Capsized		7			5	2	2	2	13	8	1	1	41
Fire		18	3		6		4	2	32	31		5	101
Flooding		19	3	3	4	3	6	1	27	59		4	129
Sunk		56	2	2	10	9	26	2	103	265	2	15	492
Engine Propeller Rudder Trouble		38	17	6	41	1	15	3	49	38		15	223
Drifting		15	1		3	4	2		8	12		2	47
Human Loss-Injury		40	3	4	9	3	50	1	42	33	2	14	201
Others-Unknown		12	1		8	2	3		17	6	1	5	55
Total		328	67	23	124	35	142	15	422	524	7	94	1,781

Source: DGSC Log Book

**Table A.2.5 Number of Marine Accidents by Kind and by Size of Ship
(1982-86)**

Tonnage Kind	0 - 100	100 - 500	500 - 1,000	1,000 - 3,000	3,000 - 10,000	10,000 - 20,000	20,000 -	Unknown Others	Total
Collision	80	65	34	47	28	6		6	266
Stranding	60	91	21	31	15	5		3	226
Capsized	24	10	1	3				3	41
Fire	37	43	8	3	5	2		3	101
Flooding	44	64	7	3	7			4	129
Sunk	232	243	6	3	1			7	492
Engine Propeller Rudder Trouble	81	88	31	12	6	2		3	223
Drifting	21	20	2	1	2			1	47
Human Loss- Injury	102	53	11	12	18	2	1	2	201
Others- Unknown	21	16	6	4	8				55
Total	702	693	127	119	90	17	1	32	1,781

Source: DGSC Log Book

**Table A.2.6 Number of Dead and Missing Persons by Marine Accident
(1982-86)**

Item	No. of Accident	No. of Death and Missing
Collision	26	64
Stranding	6	48
Capsized	17	142
Fire	21	41
Flooding	7	37
Sunk	54	330
Engine Propeller Rudder Trouble	3	16
Drifting	3	11
Human Loss- Injury	82	31
Others- Unknown	12	84
Total	231	804

Source: DGSC Log Book

Table A.2.7 Number of Human Loss and Injury Accidents by Size and by Category of Ship
(1982-86)

Tonnage Kind	0 - 30	30 - 100	100 - 300	300 - 500	500 - 1,000	1,000 - 3,000	3,000 - 10,000	10,000 - 20,000	20,000 -	Unknown Others	Total
Cargo Ship	5	6	7	2	3	9	8				40
Tanker					1		1	1			3
Passenger Ship	1			1			2				4
Tugboat	1	4	3	1							9
Barge				1		1	1				3
Fishing Vessel	19	25	6								50
Pleasure Boat	1										1
Motor Ship	11	4	12	1	5	3	4	1		1	42
Motorized Sailing Ship	5	12	15							1	33
Sailing Ship		1	1								2
Others Unknown	5	2	3		1		2	1			14
Total	48	54	47	6	10	13	18	2	1	2	201

Source: DGSC Log Book

APPENDIX III

(Section 3 Search and Rescue System)

**Data 3.1 Standard Operation of Maritime Safety Rescue Ships per year and
Rescue System Coping with Accidents**

If one ship is operated by one group of crew:

Operating days: 210 days

Legal inspection, annual routine maintenance: 105 days

General maintenance: 50 days

Breakdown of operating days

Training and exercise: 30 days

Patrol: 180 days

Therefore, for continuous operational allocation of at least one ship in the specified areas two ships (180 days x 2 ships = 360 days) will be required.

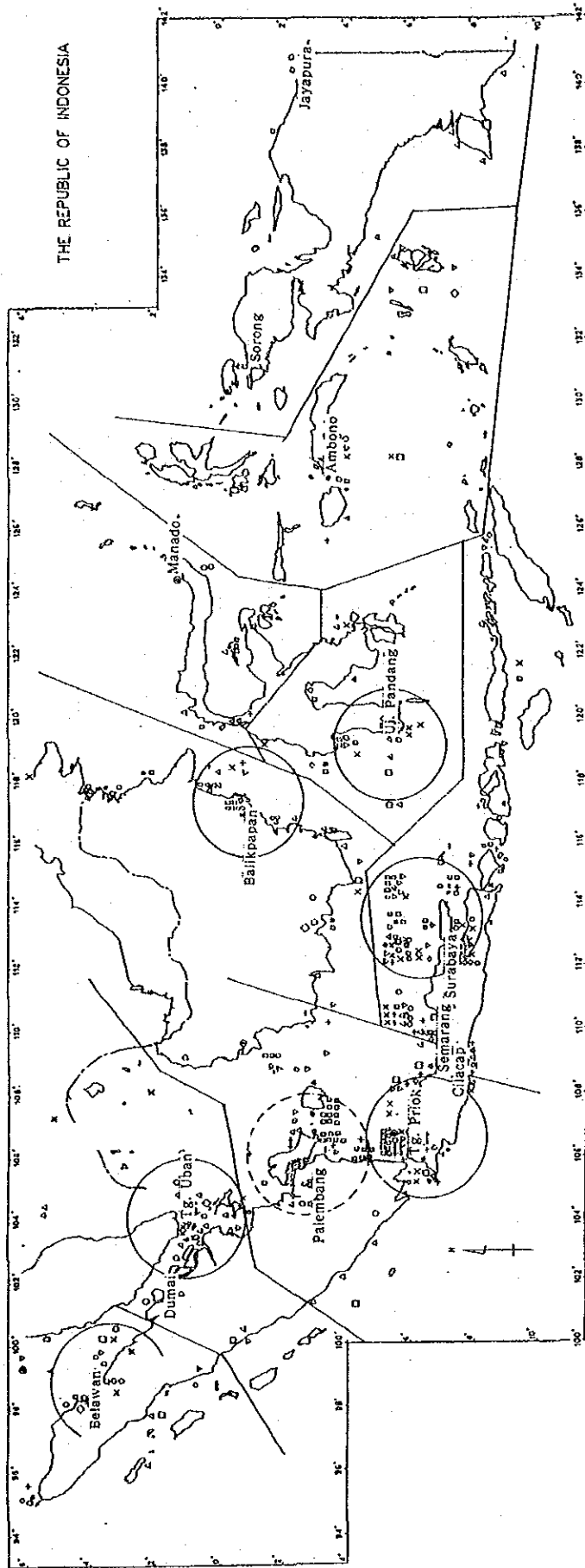
As regards the system proposed to punctually and effectively execute SAR operations at the area where high density of accidents exists, the types of Class I and II ship should be assigned, and they are also be able to punctually and effectively cope with the accidents occurred within 100 NM in radius from their station through continuous operation.

Taking into account the situations of area where maritime accidents occurred frequently, it is advisable that the appropriate operations such as advanced station and so forth need to be taken for smooth and effective execution of SAR operation.

Data 3.2 Cost Estimation of Ships, etc. for Short-term Development Plan

(Unit: Rp. million)

(1) Ships			
Class I-A	30,840 x 3 ships	=	92,520
Class I-B	23,130 x 2 "	=	46,260
Class II	7,710 x 2 "	=	15,420
Total			154,200
(2) Moorage-piers			
Piers for Class I-A	107 x 3 places	=	322
Piers for Class I-B	85 x 2 "	=	170
Total			492
(3) Special Rescue Team			
Team House	1,627 x 2 places	=	3,254
Communication			
Facilities	1,423 x 2 "	=	2,847
Materials	874 x 2 "	=	1,747
Total			7,848
(4) Disaster Prevention Facility			
Equipment and Materials			
Oil boom	296 x 5 places	=	1,480
Oil skimmer (large)	591 x 5 "	=	2,955
Oil skimmer (small)	193 x 5 "	=	965
Chemical dispersant	707 x 5 "	=	3,535
Foam concentrate	115 x 5 "	=	575
Fire-fighting devices	103 x 5 "	=	515
Handy oil recovery device	51 x 5 "	=	255
Safety device for dangerous chemicals	19 x 5 "	=	95
Gas indicator	7 x 5 "	=	35
Sub total			10,410
Equipment and materials warehouse	51 x 5 "	=	255
Total			10,665



- Legend :
- Collision
 - △ Stranding
 - Sunk
 - ◇ Fire
 - ▽ Flooding
 - ◎ Capsized
 - × Human Loss-Injury
 - + Other

- Collision
 - ▲ Stranding
 - Sunk
 - ◆ Fire
 - ▼ Flooding
 - ⊙ Capsized
- (Accidents involved human loss and missing)

Fig. A.3.1 Marine Accidents Occurred in 1982 and Always Ready System

**PRINCIPAL PARTICULARS OF
1000 GROSS TONNAGE TYPE
RESCUE SHIP**

LENGTH (O.A.)	abt. 74.40m
LENGTH (L.W.L.)	70.00m
BREADTH (M.L.D.)	10.00m
DEPTH (M.L.D.)	5.20m
DRAFT (DESIGNED) (M.L.D.)	3.60m
MAIN ENGINE	1500PS X 2 SETS
SPEED	abt. 15.0 kts.
COMPLEMENT	70 PERSONS

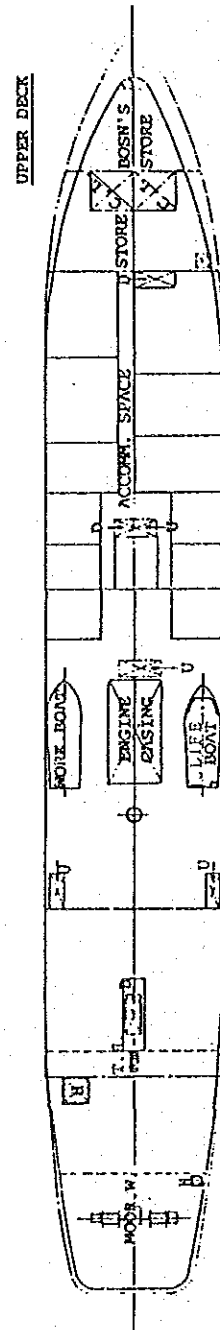
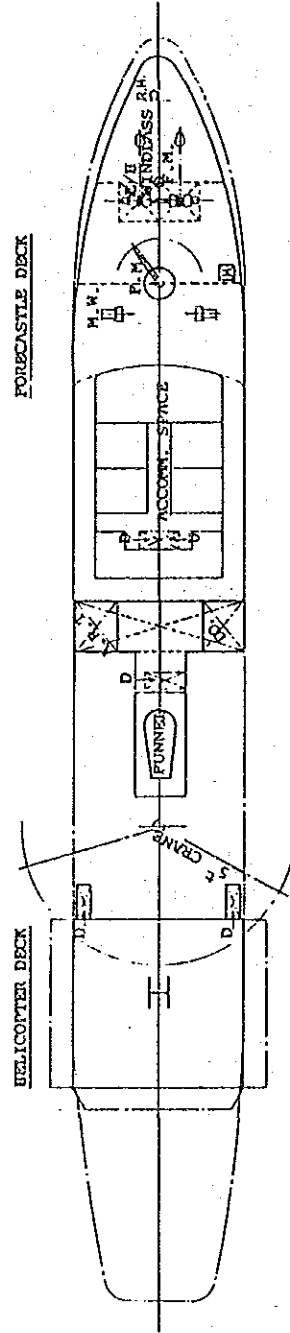
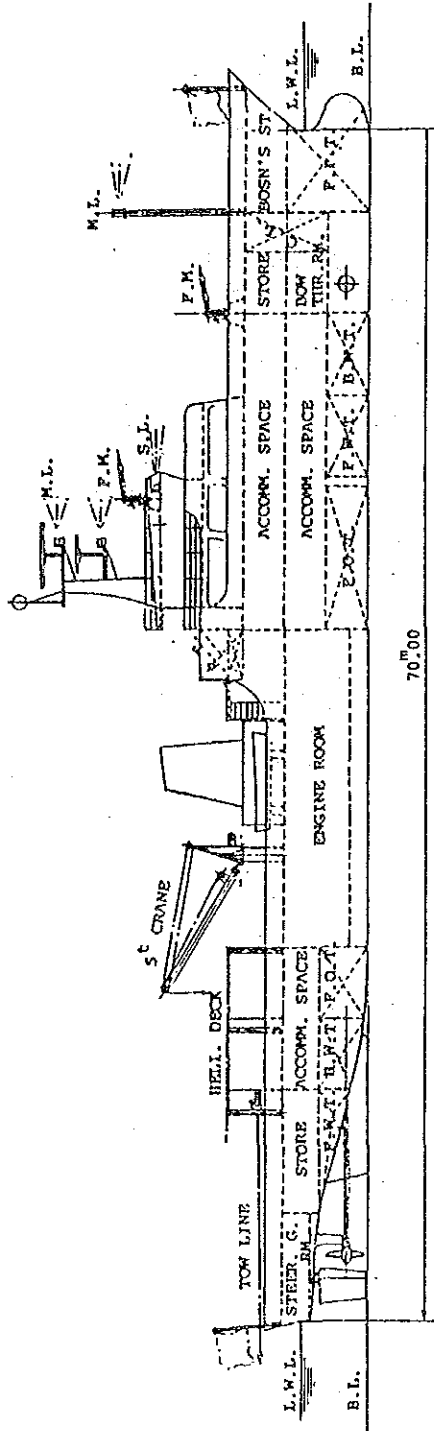


Fig. A.3.2 Conceptual Design of Class I-A Type (scale: 1/300)

**PRINCIPAL PARTICULARS OF
500 GROSS TONNAGE TYPE
RESCUE SHIP**

LENGTH (O.A.)	abt. 59.20m
LENGTH (L.W.L.)	55.00m
BREADTH (M.L.D.)	8.00m
DEPTH (M.L.D.)	4.50m
DRAFT (DESIGNED) (M.L.D.)	3.30m
MAIN ENGINE	1300PS X 2 SETS
SPEED	abt. 15.0 kts.
COMPLEMENT	55 PERSONS

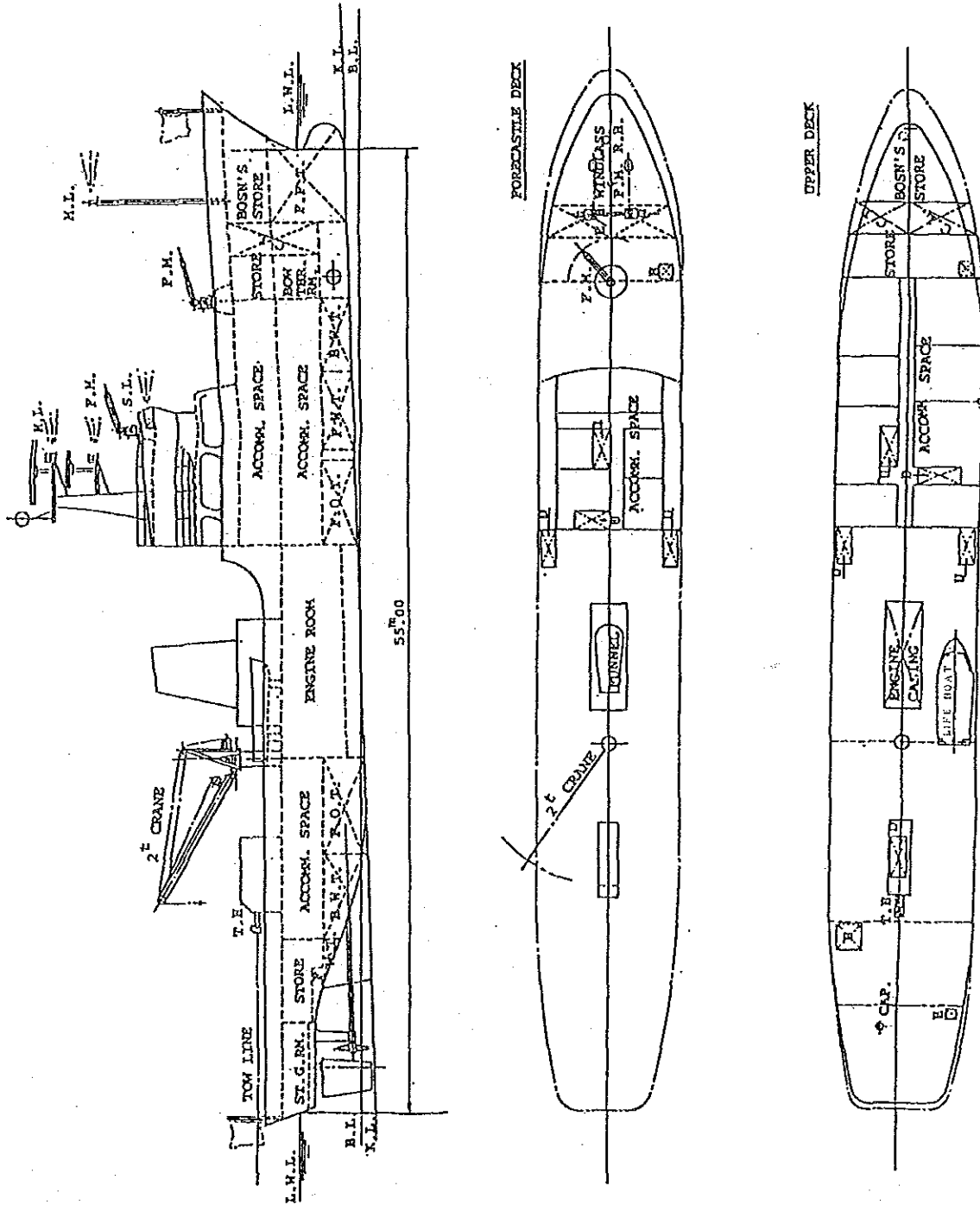
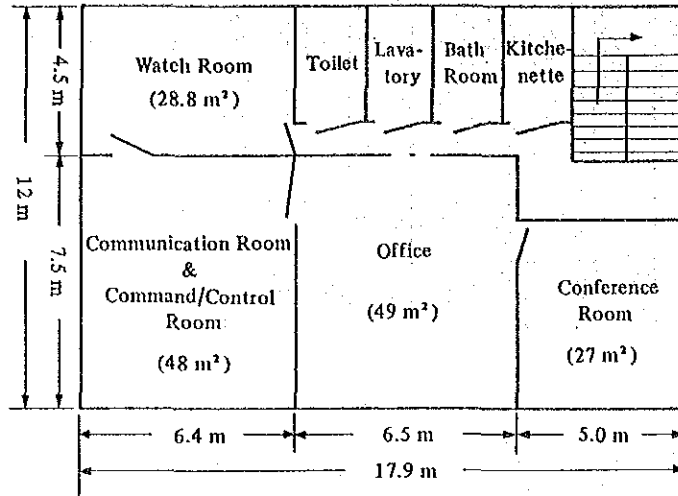
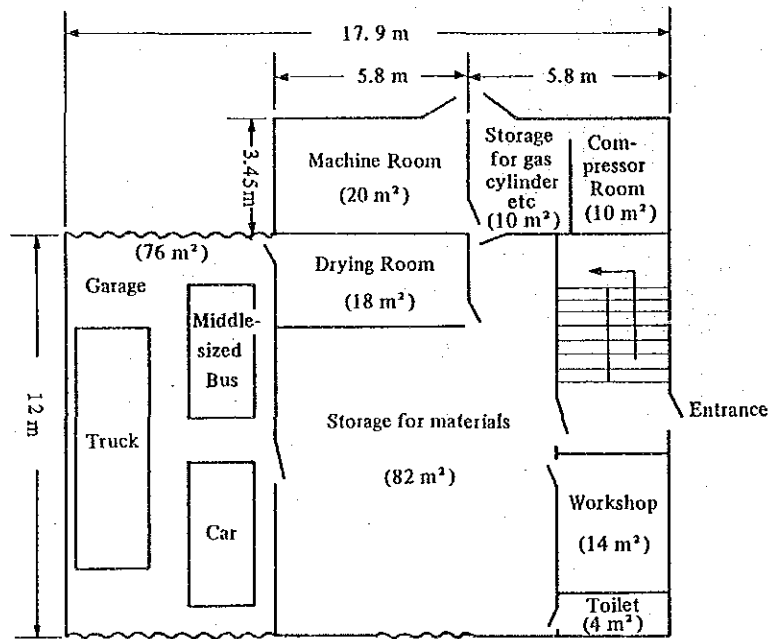


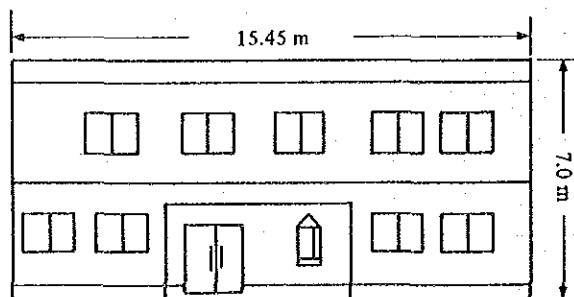
Fig. A.3.3 Conceptual Design of Class I-B Type (scale: 1/250)



2nd Floor Plan (184.2 m²)



1st Floor Plan (254.8 m²)



Side View

Fig. A.3.4 Special Rescue Station Building Proposed (Scale: 1/200)

APPENDIX IV

**(Section 4 Maritime Safety and SAR Communications
and Information System)**

4.1 Establishment of EPIRB

4.1.1 Summarized Specification

Antenna power:	5 W
Type of emission:	A2A
Transmitting frequency:	2,182 kHz
Transmitting code:	A frame of approx. 100 secs consisting of the alarm signal transmitted for about 35 seconds, one transmission of own-station code (which differs depending on the contents of the station code) and a pause of 30 sec. to 60 sec. is repeated.
Signaling speed:	10 - 11 bauds
Coverage:	More than 90 km (10 μ V/m under normal daylight conditions)
Power supply:	Dry-cell packed with case
Antenna:	Telescopic type 4 m, self-supporting

An example of its device is shown in Fig. A.4.1.



Fig. A.4.1 EPIRB

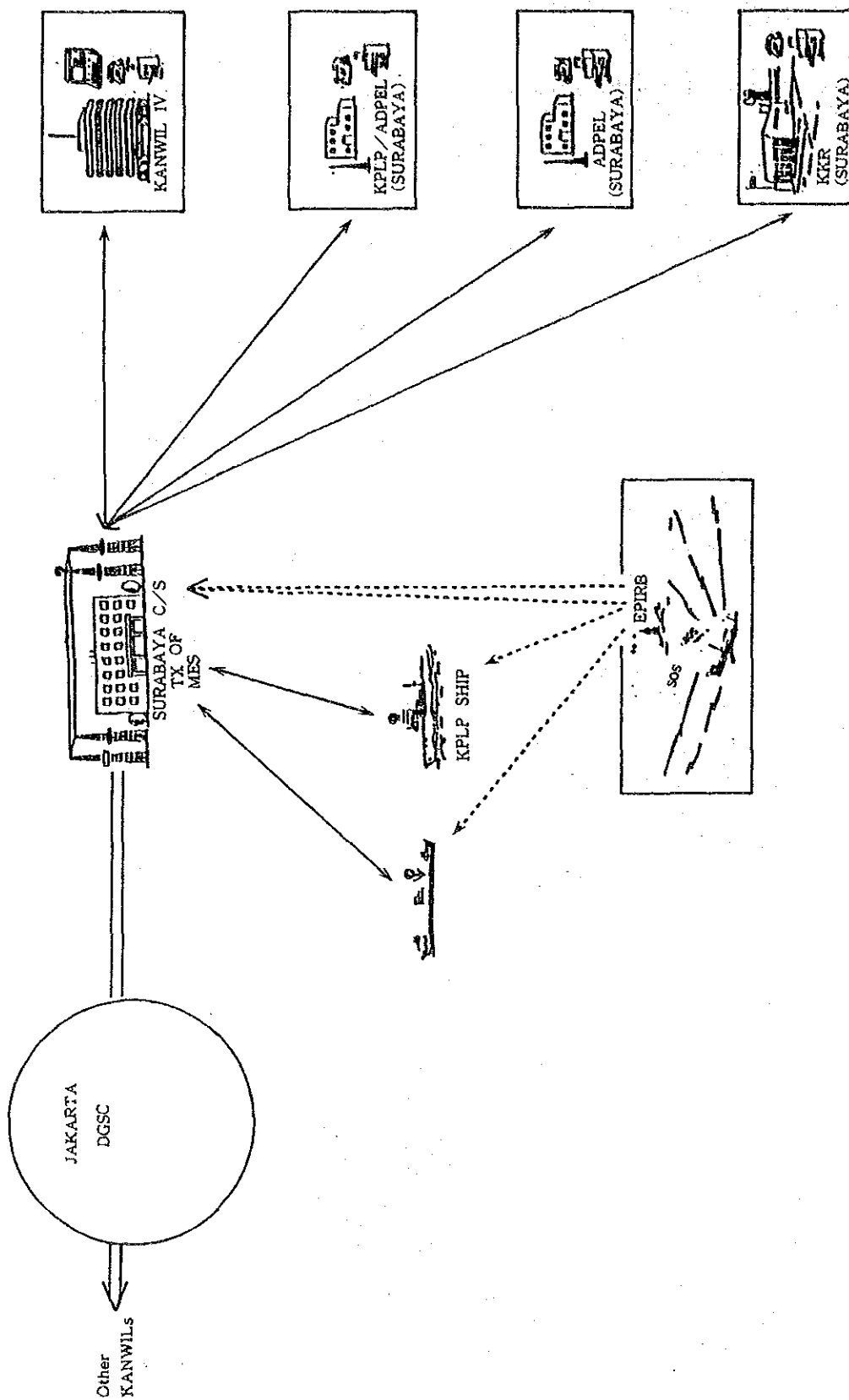


Fig. A.4.2 Example Showing EPIRB Communication Network

4.1.3 Direction Finding System

(1) On-shore The Direction finding facilities at DGSC have been established in main nine KANWILs.

Jakarta station (Receiving station)	Class I
Belawan station (Receiving station)	Class I
Dumai station (Receiving station)	Class I
Surabaya station (Receiving station)	Class I
Ujung Pandang station (Receiving station)	Class I
Bitung station (Receiving station)	Class I
Ambon station (Receiving station)	Class I
Jayapura station (Receiving station)	Class I
Semarang station (Receiving station)	Class IV

(2) DGSC ships as follows.

. KPLP ships 9 ships

- 1) KN KUJANG
- 2) KN PARANG
- 3) KN CELURIT
- 4) KN CUNDRIK
- 5) KN BELATI
- 6) KN GOLOK
- 7) KN PANAH
- 8) KN KAPAK
- 9) KN PEDANG

. Navigasi ships 11 ships

- 1) KM BIMASAKTI
- 2) KM PARI
- 3) KM MEJA
- 4) KM MINTUNA
- 5) KM KUMBA
- 6) KM KARAKASA
- 7) KM PRADANANA
- 8) KM MUCI
- 9) KM MANDALIKA
- 10) KM PAMANGANA
- 11) KM PRAJAPATI

(3) Indonesian ships engaged in an international voyage 146 ships

(4) Foreign ships navigating within the Indonesian water

4.2 Establishment of MES

4.2.1 Planning of Establishment of MES

Table A.4.1 Planning of Establishment of MES

KANWILs	Area	Offices	MES Equip. TTY Equip.		Remarks	
			Place of Installation	Number of Supply		
I	Medan - Belawan	KANWIL I		2		
		Coast Radio RX	1	1		
		KPLP/ADPEL		1		
		ADPEL		1		
		SKR		1		
II	Dumai	KANWIL II		2		
		Coast Radio RX	1	1		
		KPLP/ADPEL		1		
		DGSC	1	5		
III	Jakarta	KANWIL III		2		
		Coast Radio RX		1		
		ADPEL		1		
		FLEET KPLP KPLP/ADPEL		1	under establish- ment	
		KPLP/ADPEL		1		
		METEO		1		
		BASARNAS		1		
		KKR		1		
IV	Surabaya	KANWIL IV		2		
		Coast Radio RX	1	1		
		KPLP/ADPEL		1		
		ADPEL		1		
		KKR		1		
V	Banjarmasin	KANWIL V		2		
		Coast Radio RX	1	1		
		KPLP/ADPEL		1		
		HB, LALA/ADPEL		1		
		SKR		1		

(cont'd)

KANWILs	Area	Offices	MES Equip.	TTY Equip.	Remarks
			Place of Installation	Number of Supply	
VI	Ujung Pandang	KANWIL VI		2	
		Coast Radio RX	1	1	
		KPLP/ADPEL		1	
		ADPEL		1	
		KKR		1	
VII	Manado - Bitung	KANWIL VII		2	
		Coast Radio RX	1	1	
		HB/ADPEL (Manado)		1	
		KPLP/ADPEL (Manado)		1	
		HB/ADPEL (Bitung)		1	
		SKR		1	
VIII	Ambon	KANWIL VIII		2	
		Coast Radio RX	1	1	
		KPLP/ADPEL		1	
		ADPEL		1	
		SKR		1	
IX	Jayapura	KANWIL IX		2	
		Coast Radio RX	1	1	
		KPLP/ADPEL		1	
		ADPEL		1	
	Total		8	47	Except Jakarta Area

4.2.2 Composition of MBS

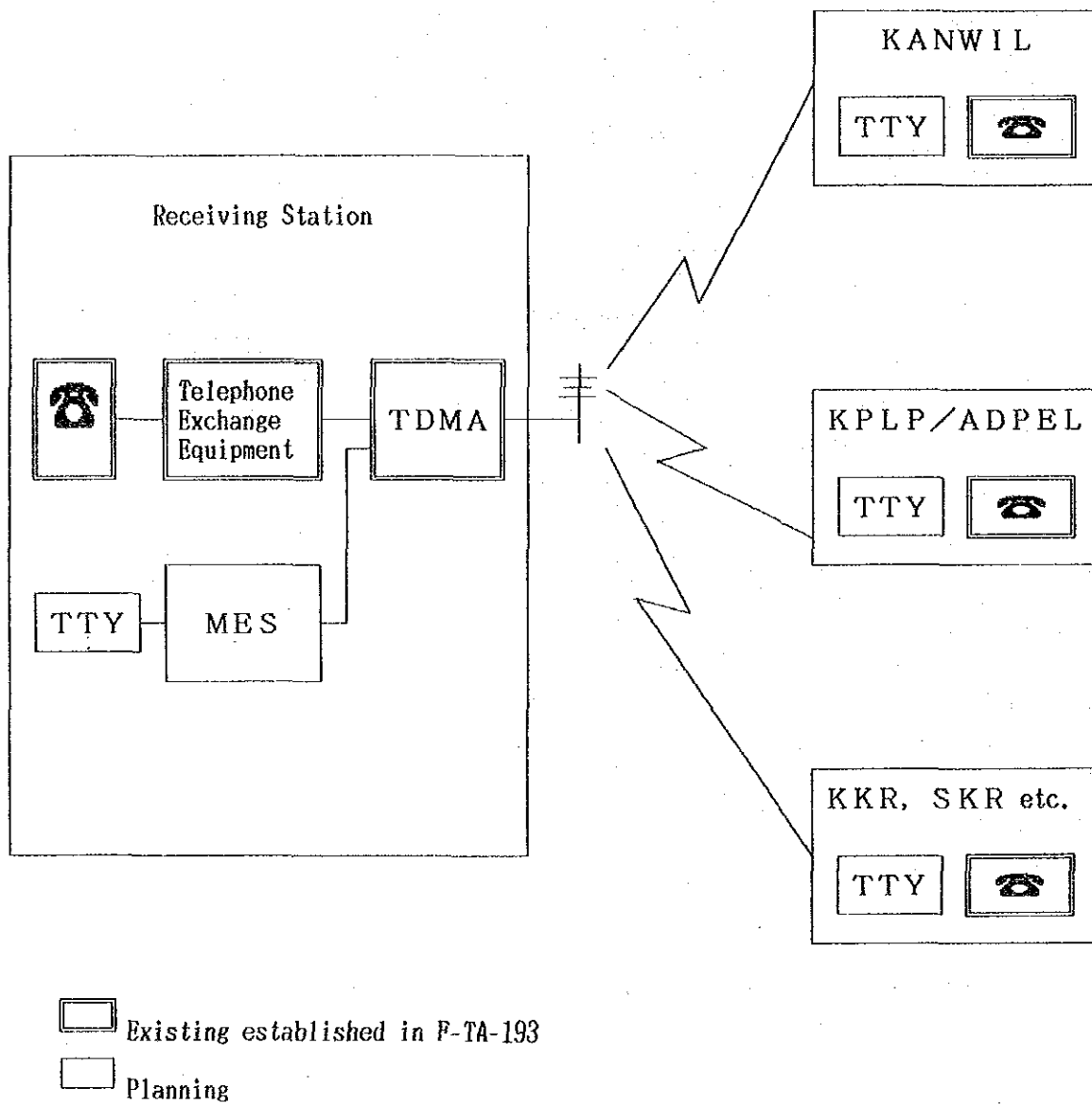


Fig. A.4.3 Composition of MBS

4.2.3 Communication System of MES

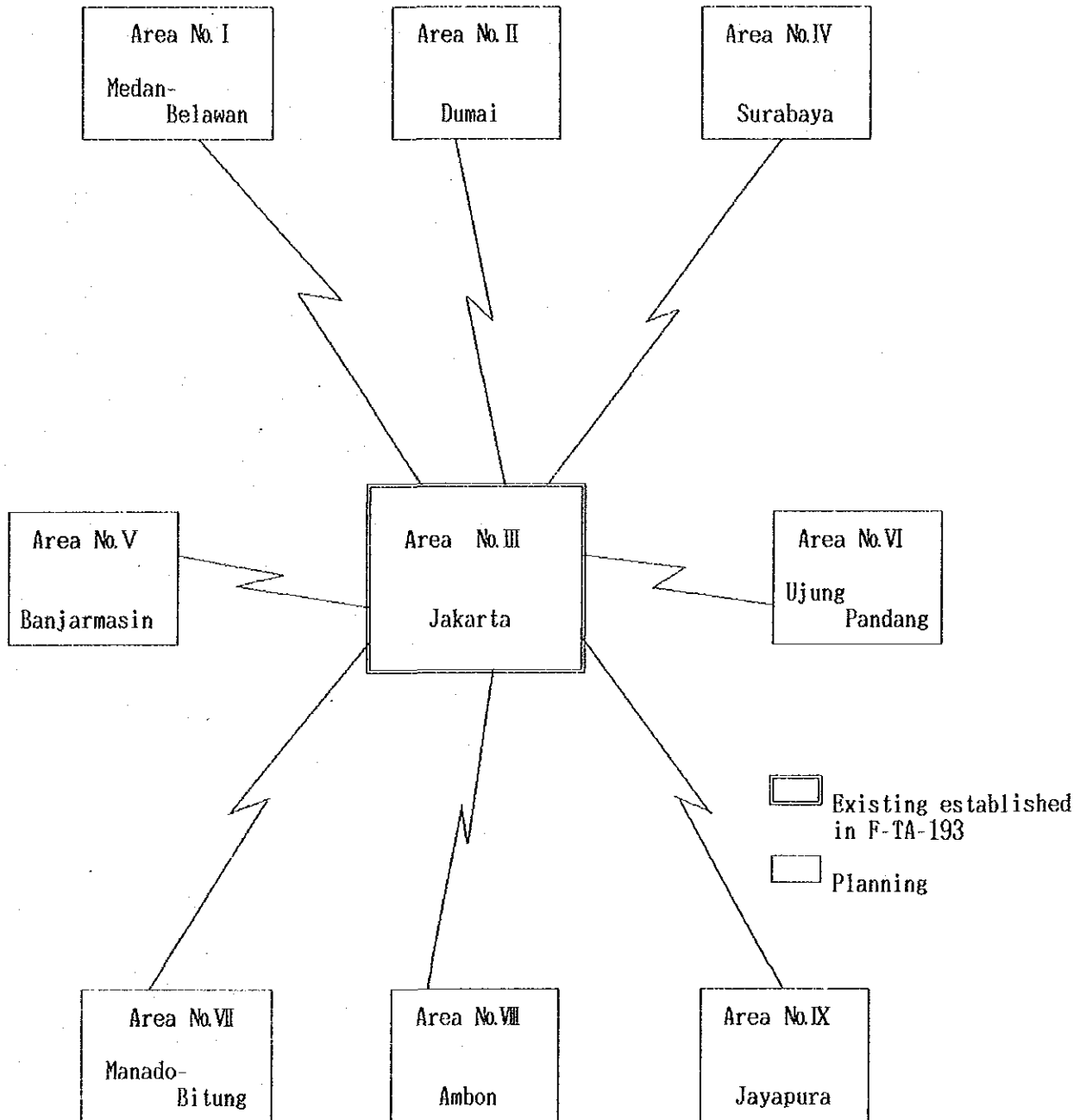


Fig. A.4.4 Communication System of MES

4.3 Network Links with Newly Planned Organizations

4.3.1 Establishment of Special Rescue Base Station

Communication network in Jakarta area as shown in Fig. A.4.5, and in Surabaya area as shown in Fig. A.4.6 respectively.

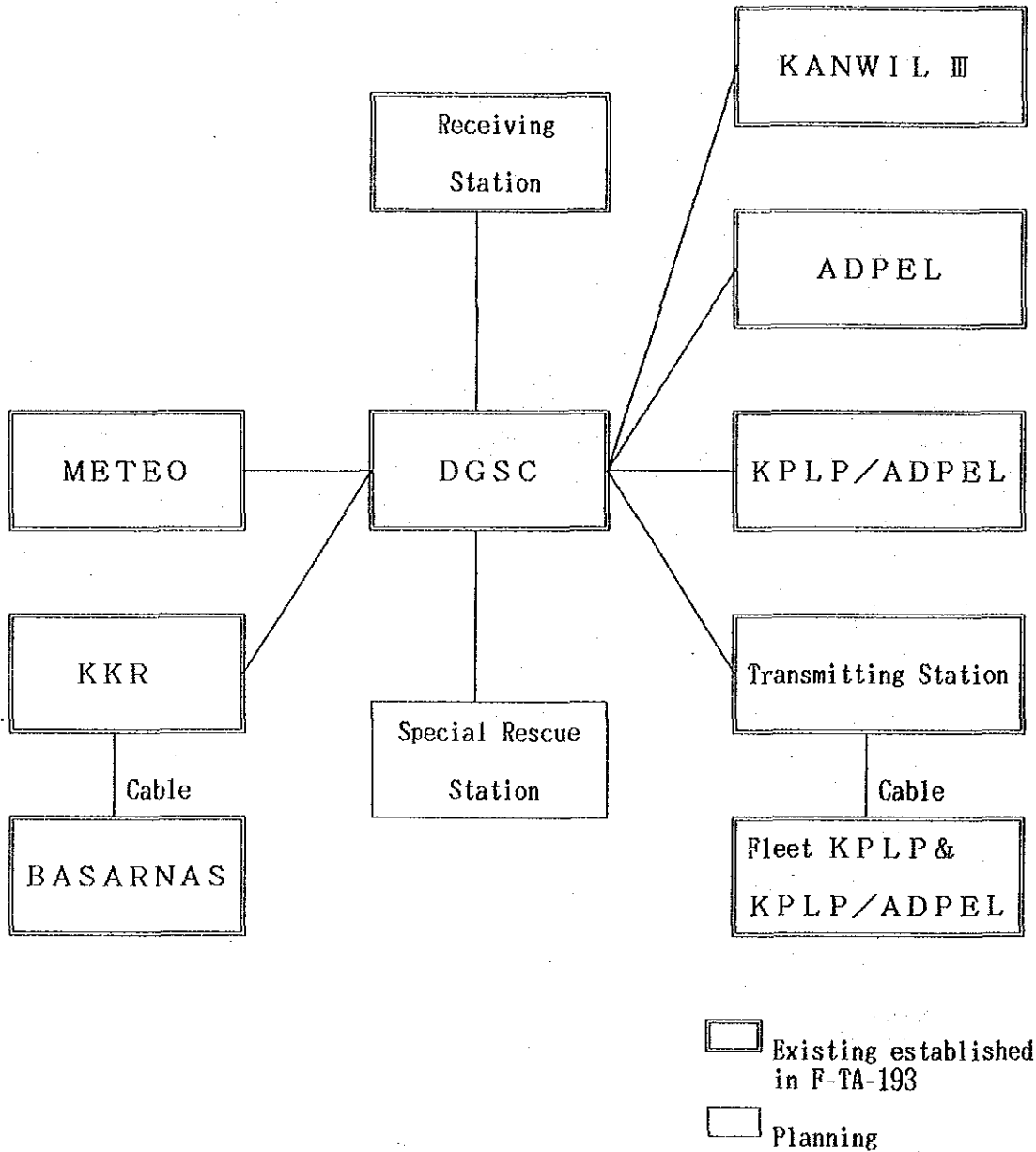


Fig. A.4.5 Communication Network in Jakarta Area

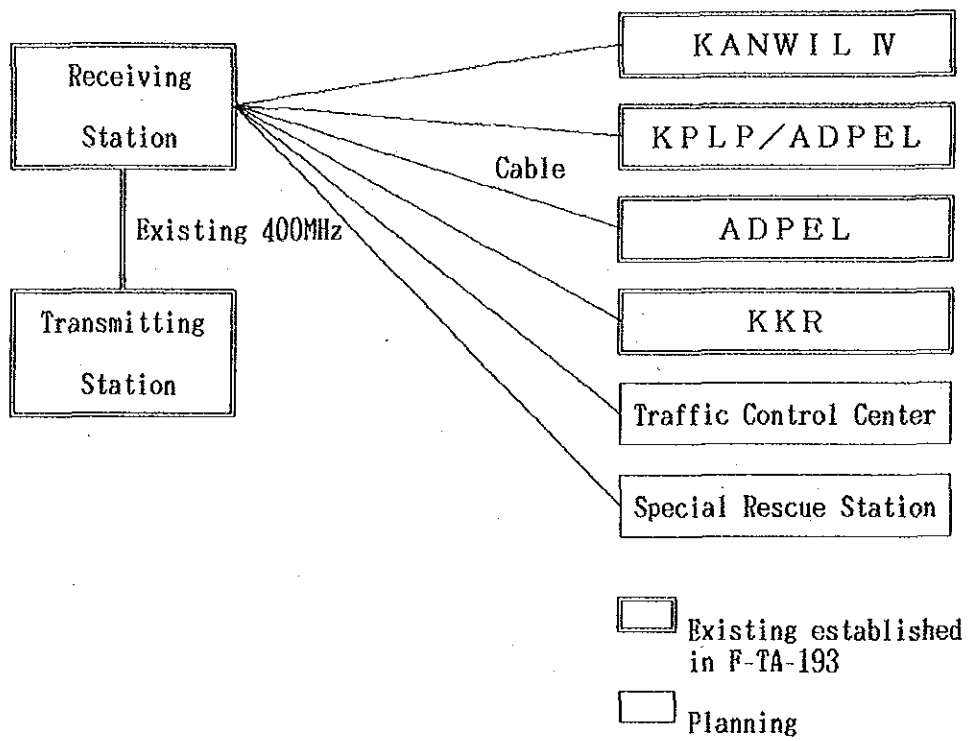


Fig. A.4.6 Communication Network in Surabaya Area

4.3.2 Establishment of Traffic Control System

Network links as shown in Fig. A.4.6.

APPENDIX V

(Section 5 Harbour Traffic Control System)

Table A.5.1.1 Ships Call in Surabaya (Tg.Perak)

(Unit: No. of Ships)

Line Category	Year					
	1982	1983	1984	1985	1986	
Oceangoing	1,048	1,095	995	901	1,008	
Inter-island	2,433	2,374	1,863	2,260	2,434	
Special	243	237	615	598	656	
Local	1,834	1,776	2,118	1,872	2,161	
Sailing	5,549	5,482	3,555	3,437	2,910	
Total	10,097	9,532	9,141	9,068	9,169	

Source: DGSC Data

Table A.5.2 Number of Marine Accidents by Kind in Surabaya (1982-86)

(Unit: No. of Ships)

Collision	Stranding	Fire	Flooding	Sunk	Engine Propeller	Drifting	Human Loss	Others	Total
11	2	3	8	2	3	-	3	-	32

Source: DGSC Log Book

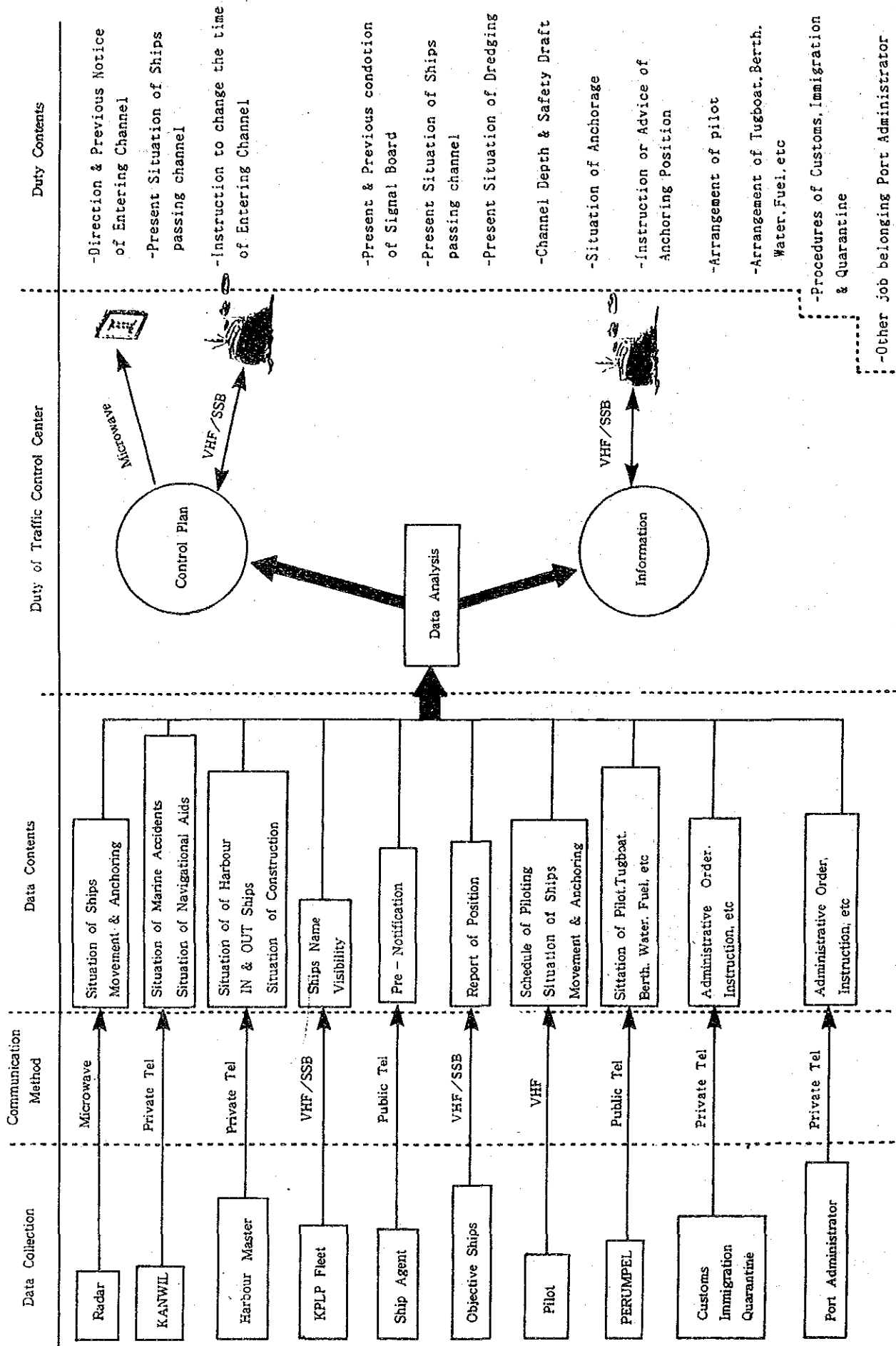


Fig. A.5.1 Duty Outline of Traffic Control Center

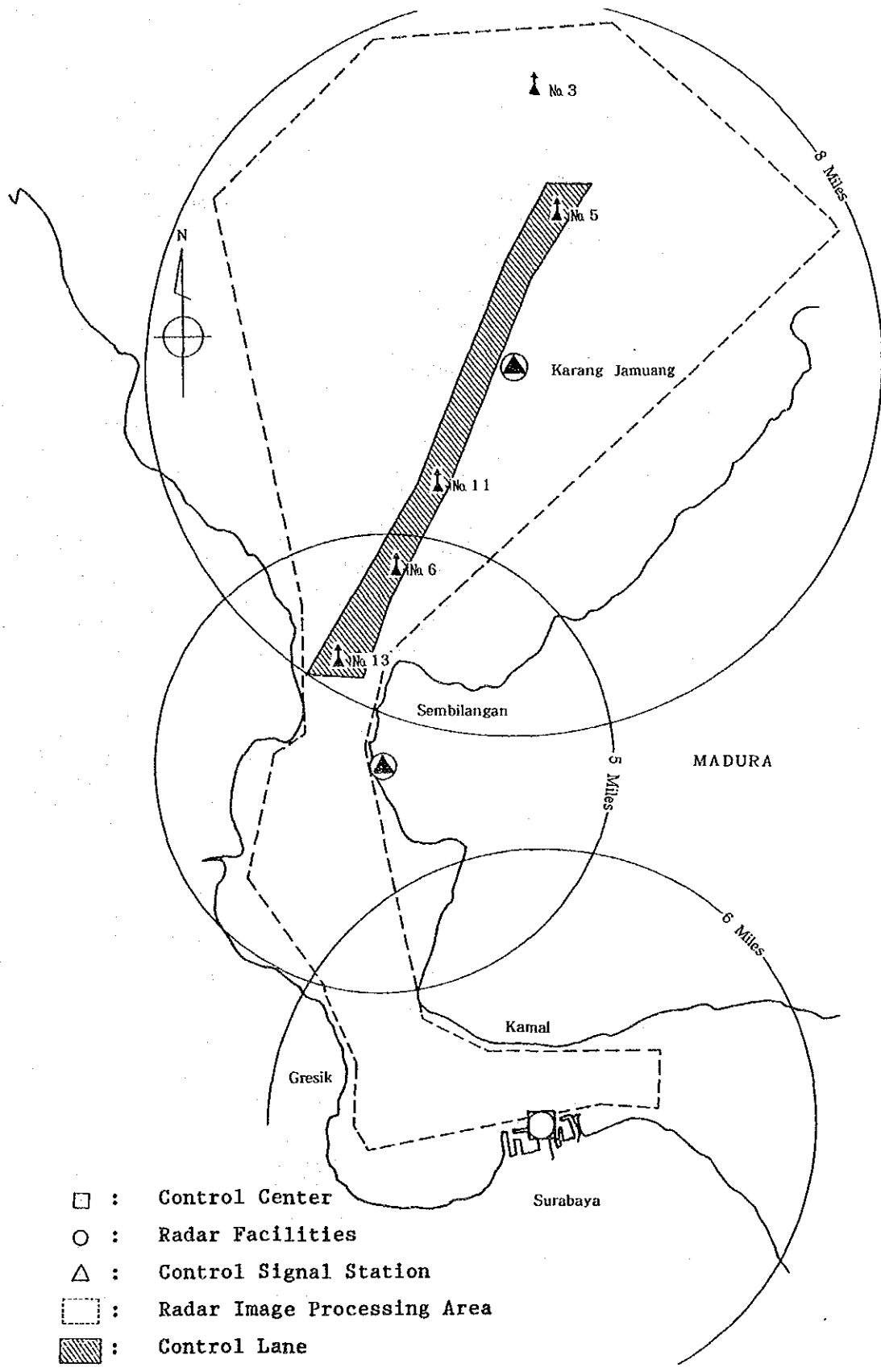


Fig. A.5.2 Radar Image Processing Area
in the West Channel of Surabaya

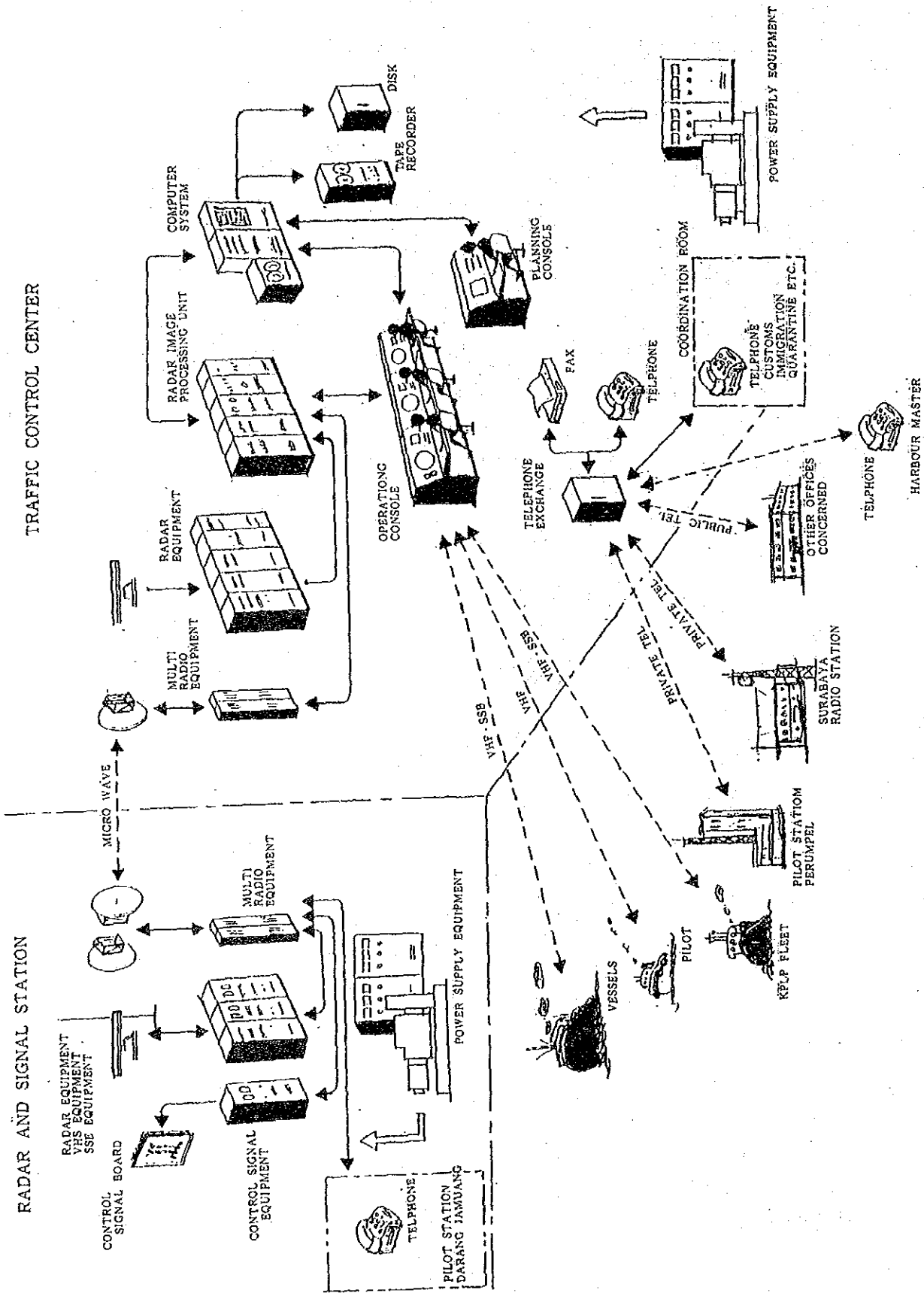


Fig. A.5.3 Traffic Control System in the West Channel of Surabaya

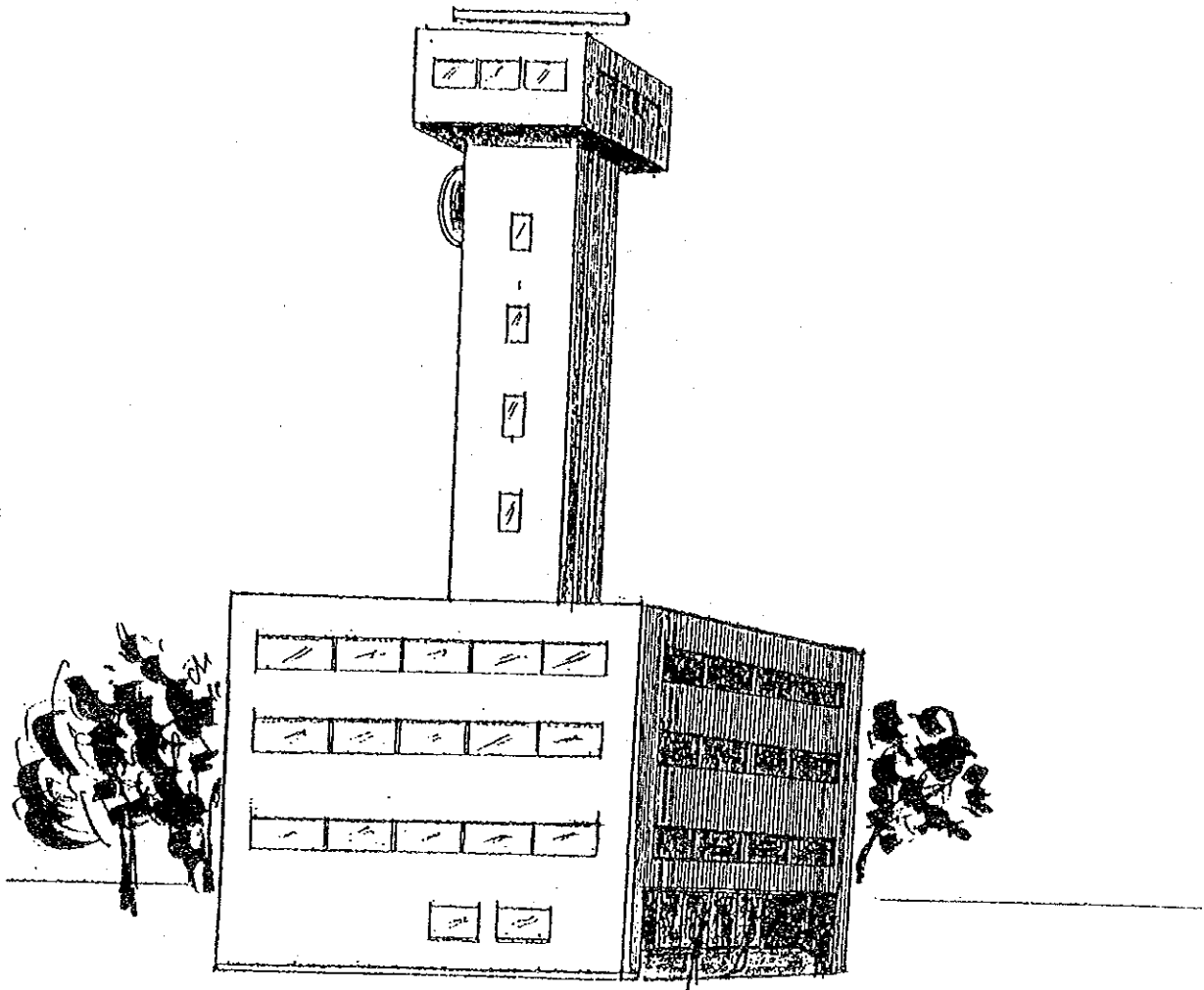


Fig. A.5.4 Surabaya Harbour Traffic Control Center

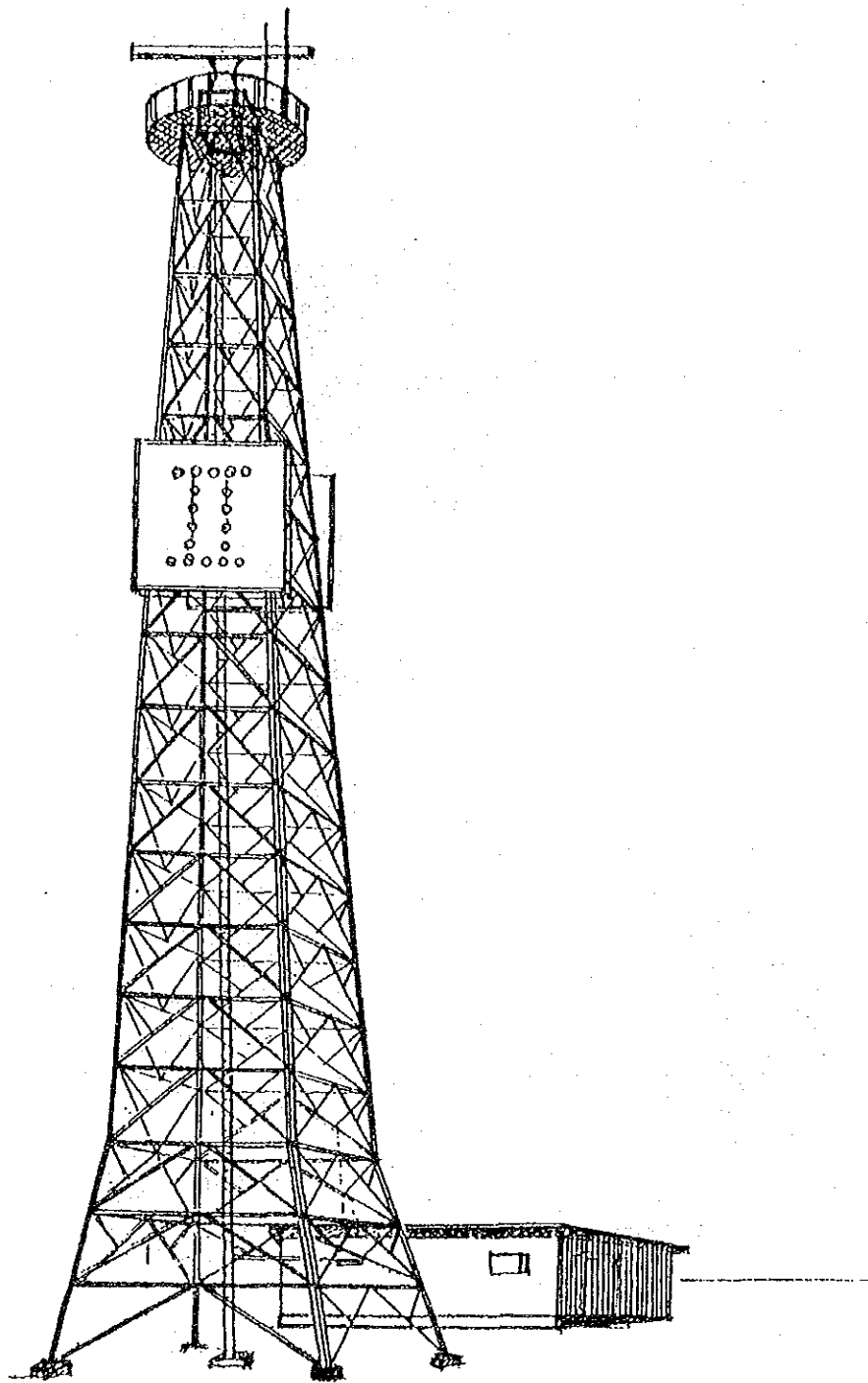


Fig. A.5.5 Radar and Signal Station

Table A.5.3 Investment Plan of Surabaya Harbour Traffic Control System
(Unit: Rp. million)

		Investment	1989	1990	Note
1. SITE					
(1) Center	1	772	772	-	
(2) Radar and Signal Station	2	1,027	1,027	-	
Sub Total		1,799	1,799	-	
2. FACILITY					
(1) Center	1	4,305	4,305	-	
(2) Radar and Signal Station	2	1,285	1,285	-	
Sub Total		5,590	5,590	-	
3. EQUIPMENT					
(1) Center	1				
Radar and ITV Equipment Processing Unit		1,863	1,863		
Computer System		4,047	2,698	1,349	
Operating Console		2,056	2,056	-	
Planning Console		2,018	899	1,119	
Multi Radio Equipment		296	296	1,156	
Uninterruptive Power Supply System		1,156	989	-	
Tel Exchange, etc.		989	989	-	
Sub Total		515	515	-	
(2) Radar and Signal Station	2				
Radar Equipment		12,940	9,316	3,624	
Multi Radio Equipment		4,677	-	4,677	
VHF, SSB Equipment		3,072	-	3,072	
Control Signal Equip.		193	-	193	
Uninterruptive Power Supply System		835	-	835	
Sub Total		1,413	-	1,413	
Sub Total		10,190	-	10,190	
4. INSTALLATION, ADJ & TEST					
(1) Center	1	1,928	1,928	-	
(2) Radar and Signal Station	2	1,747	-	1,747	
Sub Total		3,675	1,928	1,747	
5. SPARE PARTS, TRAINING & MISCELLANEOUS					
Sub Total		2,827	-	2,827	
Sub Total		2,827	-	2,827	
Total		37,021	18,633	18,388	

APPENDIX VI

**(Section 6 Training System for Maritime Safety
and SAR Personnel)**

6.3 Training

6.3.1 Outline of Training System

The training system for maritime safety and SAR personnel will be suggested as follows.

Table A.6.1 Training System Courses

		Training Course for:	Course No.	Training Period	
Training	General Training	Training of Newly Recruited Personnel	Qualified Personnel	(I)	6 months
			University Graduate		
			Unqualified Personnel (Senior High School Graduate)	(II)	1 year
		Other Personnel	-	6 months	
		Re-Training of Present Personnel	Executive Officer Candidates	-	6-12 months
	Senior Officer Candidates		(III)	6-12 months	
	Special Training	Special Rescue		(IV-1)	6 months
		Rescue Diving		(IV-2)	3 months
		Disaster Prevention		(IV-3)	1 month
		Information Communications		(IV-4)	3 months
Navigation Aids		(IV-5)	3 months		
Harbour Traffic Control etc.		(IV-6)	3 months		
Result will be feeded back to each course.					
Research & Development					

(4) Life in the MSTC

An example of daily activities for the trainee is as follows:

Table A.6.2 Daily Routine Plan at the MSTC Dormitory

5:00 - 6:00	Getting up/physical training, preparation for daily task
6:00 - 6:30	Breakfast
6:30 - 7:00	Morning briefing
7:00 - 13:00	Morning classes
13:30 - 14:00	Lunch
14:00 - 16:00	Sleeping/personal use
16:00 - 17:00	Sport, club and social activities
17:00 - 18:00	Taking a bath
18:00 - 18:30	Dinner
18:30 - 21:00	Afternoon classes
21:00 - 22:00	Evening study
22:00 -	Putting out lights/sleeping

6.3.2 Training Course

An outline of typical curriculum of training courses is as follows.

- (1) General Training
- (i) Training of newly recruited personnel

Table A.6.3 A Plan of Curriculum of Training Course for Unqualified Personnel (Senior High School Graduate) II

(Training period is one year)

Training Subjects	Classes and Training Hours	
	Information Communication	Navigation Aids
General Studies	20	20
Pancasila	90	90
General Basic Studies	60	60
English	90	60
Mathematics	90	60
Physics	60	30
Data Processing	30	30
Physical Training	60	60
Radiotelegraph Engineering	300	300
Radiotelegraphic Equipment and Tools	150	-
Telecommunications and Seamanship	210	60
Electronic Telecommunication Engineering	30	150
Electrical Equipment and Tools	30	90
Navigation Aids	-	210
Rescue	60	60
Search	20	20
Traffic Safety	20	20
Maritime Disaster Prevention Training	20	20
On-the-job Training	60	60
	30	30
Total	1,430 hours	1,430 hours

(ii) Re-training

Table A.6.4 A Plan of Curriculum of Training Course
for Senior Officer Candidates (III)

(This training course for three months is transitional
until the proper course will be implemented)

(Training period is three months)

Training Subjects	Training Hours
General Studies	70
Outline of Maritime Safety	40
Basic Laws and Regulation	40
International Law and Conventions	30
Theory of Search	40
Theory of Rescue	40
Theory of Maritime Disaster Prevention	40
Maritime Traffic Law	30
Maritime Traffic Management	40
Theory of Information Processing	40
Case Study	40
Total	450 Hours

(3) Special Training

(1) Special Rescue (IV-1)

Table A.6.5 A Plan of Curriculum of Training Course
for Special Rescue

(Training period is six months)

Training Subjects	Training Hours
General Studies	40
Lecture	
Diving	50
Ranger	30
Fire Fighting	20
Safety Management	5
Operation Research	25
Practice	
Diving	190
Ranger	180
Fire Fighting	20
Physical Training	50
Ability Test (Physical, Diving)	15
Planning for Special Rescue	25
Total	650 Hours

6.4 Plan of Facilities

6.4.1 Basic Plan of Facilities

(1) Outline of Facilities Plan

Location of Facilities for MSTC	(Fig. A.6.1)
Plan of Main Building & Class Room	(Fig. A.6.2)
Plan of Laboratory Block	(Fig. A.6.3)
Plan of Auditorium & Gymnasium	(Fig. A.6.4)
Plan of Dormitory	(Fig. A.6.5)

1. Main Building & Class Room
2. Laboratory Block
3. Dormitory
4. Auditorium & Gymnasium
5. Dressing Room & Shower Room
6. Fire Fighting
7. Power Supply Room
8. Article Store House
9. Boat Store House
10. Ranger Tower
11. Machine Room
12. Substation
13. Guard House
14. Tennis Court
15. Swimming Pool
16. Athletic Field
17. Pier
18. Slipway
19. Car Park

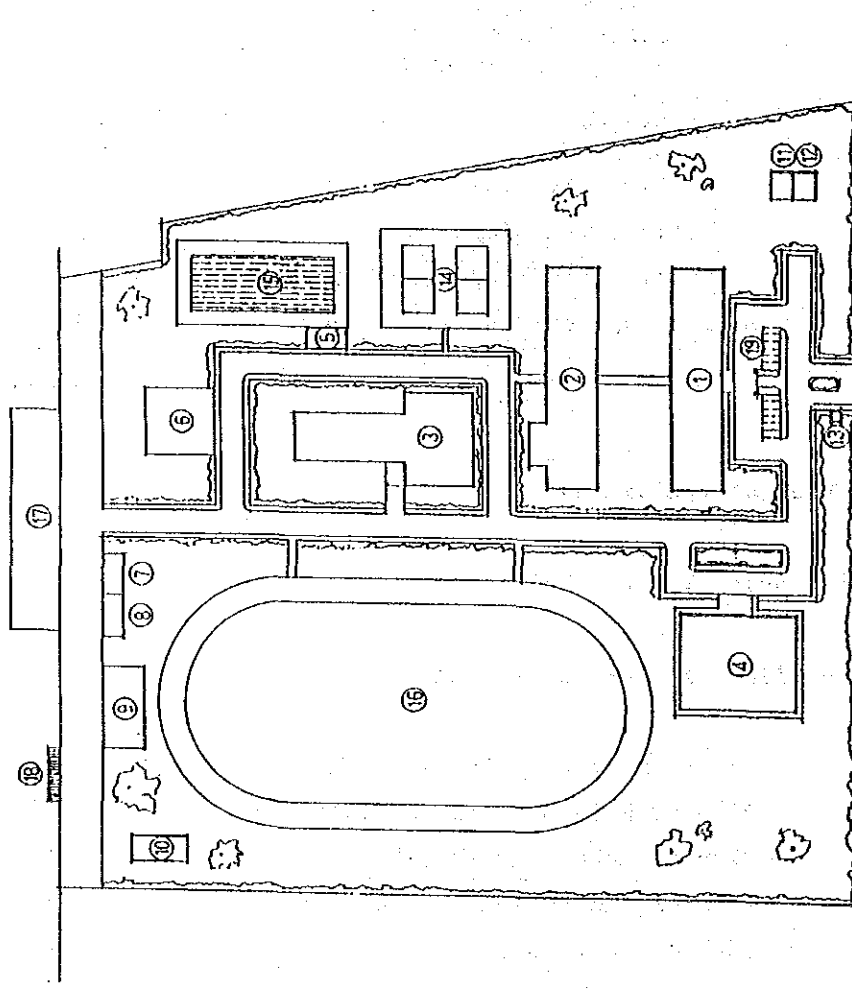
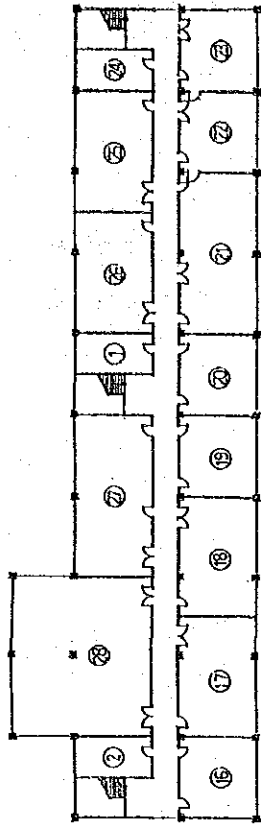
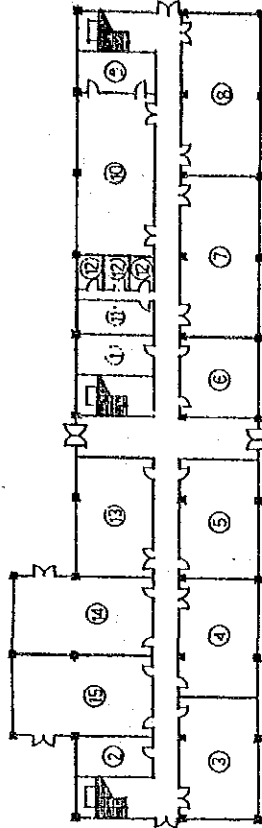


Fig. A.6.1 Layout Plan of Facilities for Maritime Safety Training Center



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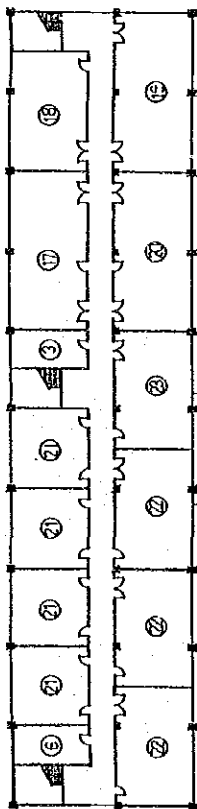


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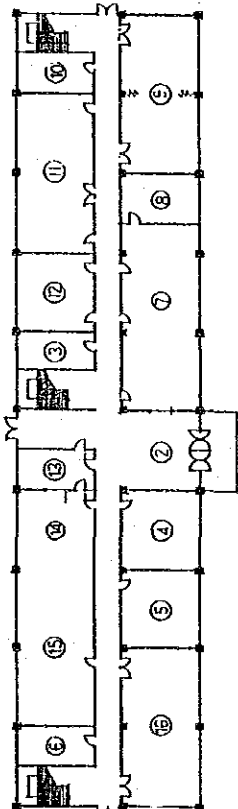
Fig. A.6.3 Laboratory Block

- | | |
|---------------------------------------|-----------------------------------|
| 1. Toilet | 15. Marine Engine TRM |
| 2. Teaching Material Storage | 16. Steering TRM |
| 3. Ironwork TRM | 17. Chart Work TRM |
| 4. Multipurpose TRM | 18. Visual Aid to Navigation TRM |
| 5. Search & Rescue TRM | 19. Audible Aid to Navigation TRM |
| 6. Computer TRM | 20. Meteorology Oceanography TRM |
| 7. Identification & Investigation TRM | 21. Radio Apparatus TRM |
| 8. Chemistry Laboratory | 22. Radar TRM |
| 9. Chemical Storage | 23. Wired Circuit TRM |
| 10. Pollution Analysis Laboratory | 24. Radio Apparatus RM |
| 11. X-ray Examination RM | 25. Communication Operation TRM |
| 12. Dark Room | 26. Radio-wave TRM |
| 13. Auxiliary Engine TRM | 27. Nautical Instrument TRM |
| 14. Automatic Control TRM | 28. Seamanship TRM |

RM = Room, TRM = Training Room



2ND FLOOR

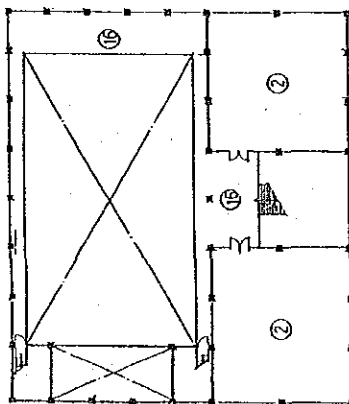


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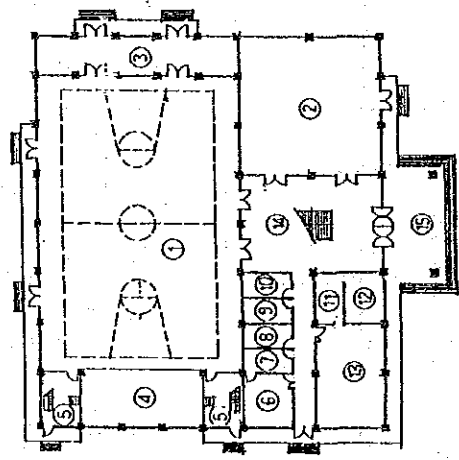
Fig. A.6.2 Main Building & Class Room

- | | |
|------------------------------|--|
| 1. Carriage Porch | 12. Office Instrument Room |
| 2. Entrance Hall | 13. Office for Library |
| 3. Toilet | 14. Reading RM |
| 4. Reception Room | 15. Book Vault |
| 5. Anteroom for Instructors | 16. Maritime Safety Development & Survey TRM |
| 6. Teaching Material Storage | 17. Maritime Traffic Regulation TRM |
| 7. Office | 18. Language TRM |
| 8. Superintendent's RM | 19. Classroom (B) |
| 9. Conference RM | 20. Engineering: Drawing |
| 10. Telephone Exchange RM | 21. Classroom (S) |
| 11. Lecturers RM | 22. Classroom (M) |

RM = Room, TRM = Training Room

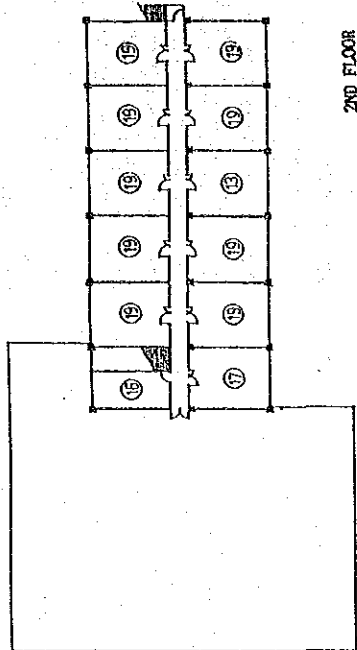


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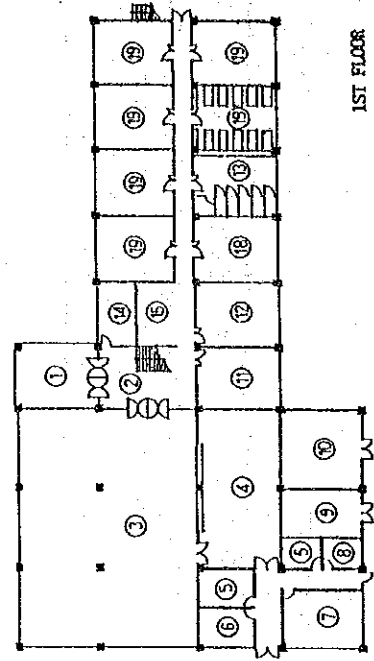


1ST FLOOR

1. Physical Hall & Auditorium
2. Exercise Hall
3. Stage for Apparatus
4. Stage
5. Anteroom
6. Drying RM
7. Laundry
8. Store
9. Men's Toilet
10. Women's Toilet
11. Wash RM
12. Shower RM
13. Dressing RM
14. Entrance Hall
15. Lobby
16. Gallery



2ND FLOOR



1ST FLOOR

Fig. A.6.5 Dormitory

1. Lobby
2. Entrance Hall
3. Dining Hall
4. Kitchen
5. Food Storage
6. Office
7. Rest RM, Dressing RM
8. Toilet
9. Transformer RM
10. Air-condition Handling Unit
11. Administrative Office
12. Recreation RM
13. Toilet, Shower, Wash RM
14. Guest Room
15. Kiosk
16. Rest RM
17. Medical RM
18. Store
19. Bed RM

Fig. A.6.4 Auditorium & Gymnasium

(iii) Materials and Equipment for Training

Table A.6.6 Materials and Equipment for Training for MSTC

I Basic Subject		
1. Basic Subject		
1) Instrument for physical experiments		1 set
2) Instrument for chemical experiments		1 set
2. Foreign languages		
1) Apparatus for linguistic exercises		1 set
3. Health and physical education		
1) Sports apparatus		1 set
II Basic Professional Subjects		
1) Lifesaving Equipment		1 set
2) Identification tools		1 set
3) Marine fire-fighting apparatus		1 set
III Professional Subjects		
1. Navigation-related subjects		
1) Chart instrument		1 set
2) Nautical instrument		1 set
3) Seamanship apparatus		1 set
4) Weather observation apparatus		1 set
2. Engineering-related subjects		
1) Machine tool; materials testing machine		1 set
2) Drawing instruments		1 set
3) Machinery and tools for marine engine		1 set
4) Electric machines and tools for ships		1 set
3. Communication-related subjects		
1) Electrical measuring instruments		1 set
2) Communications equipment		1 set
3) Radio navigation equipment		1 set
4) Laboratory equipment of electrical Engineering		1 set

4. Navigation aids-related subjects

- | | |
|----------------------------|-------|
| 1) Electrical instruments | 1 set |
| 2) Radio aid instruments | 1 set |
| 3) Visual aid instruments | 1 set |
| 4) Audible aid instruments | 1 set |

IV On-the-job Training

- | | |
|--------------------------------|-------|
| 1) Boats and related equipment | 1 set |
| 2) Diving apparatus | 1 set |
| 3) Signal instruments | 1 set |

V Other

1 set

6.5 Administration and Management of the MSTC

6.5.1 Administration and Management

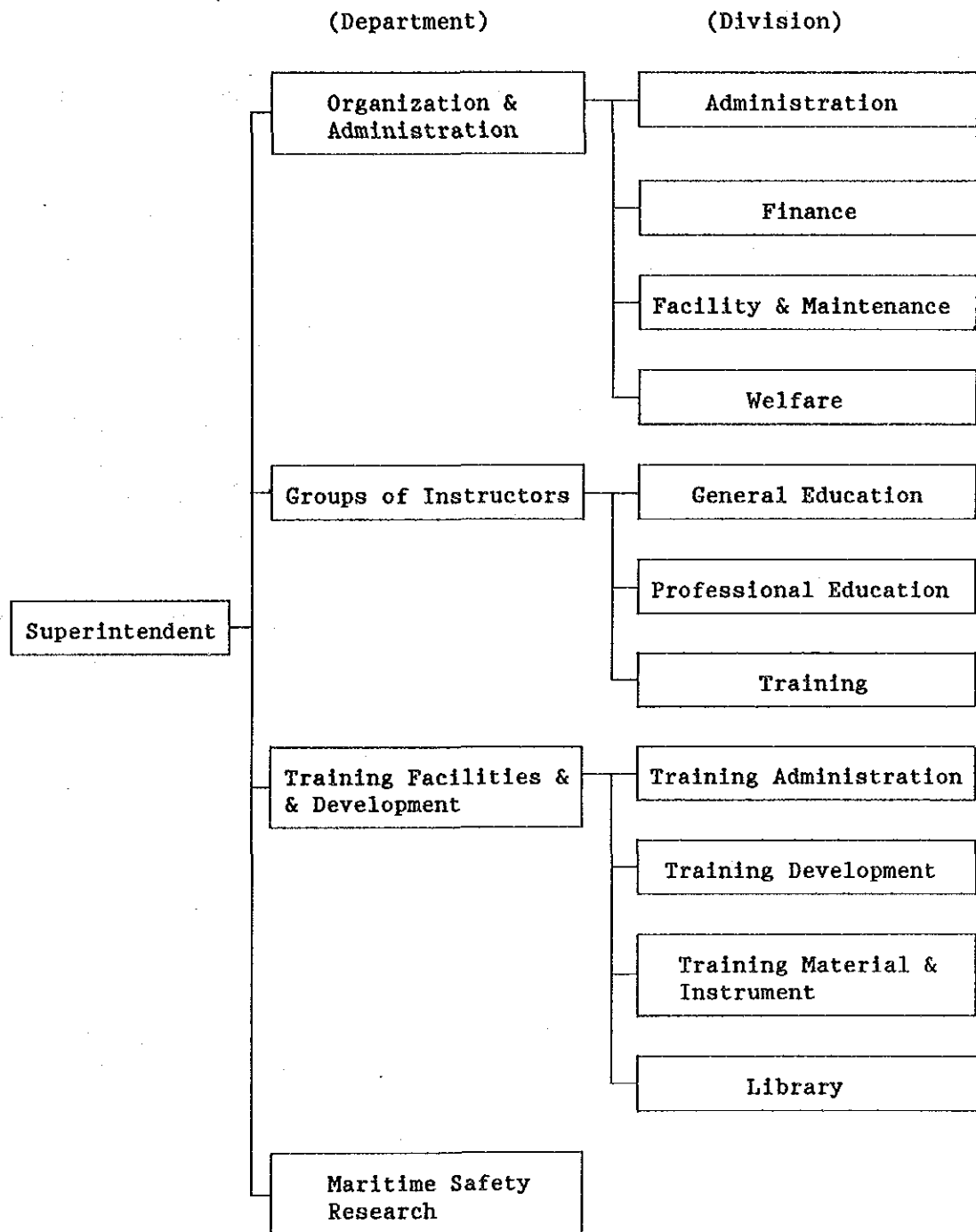


Fig. A.6.6 Organization Chart of the MSTC

6.5.3 Maintenance Cost

Approximate annual maintenance costs are to be calculated by referring to the existing similar training facility in Indonesia, which accommodates about 700 students and trainees.

The annual maintenance cost and number of personnel of the similar facility are as follows:

i) Number of instructors and staff	120 persons
ii) Annual budget	Rp. 228 million
iii) Number of students and trainees	
Students 130 persons x 1 year x 1 time	130 persons per year
Trainees 550 persons x 1 week x 1 time	500 persons per year
20 persons x 3 months x 1 time	20 persons per year
Others	50 persons per year
<hr/> Total	<hr/> 700 persons per year

As the number of administration staff of existing similar facility is the same as that of the MSTC, approximate maintenance cost of the MSTC is calculated on the basis of the above items.

Approx. maintenance cost (excluding trainees)

$$\text{Rp. 228 million} + 130 \text{ persons/year} \times 200 \text{ persons/year} = \text{Rp. 350 million}$$

Approx. maintenance cost (including trainees)

$$\text{Rp. 228 million} + 140 \text{ persons/year} \times 200 \text{ persons/year} = \text{Rp. 314 million}$$

According to the above results, annual maintenance cost (excluding meal expenses) may be estimated at approx. Rp. 300 to 350 million per year.

APPENDIX VII

(Section 7 Organizational System)

Table A.7.1 Crew Organization of Maritime Safety Rescue Ships

(Unit: Number of persons)

Position	Type	Class I-A	Class I-B	Class II	Class III	Class IV
Commanding Officer		1	1	1	1	1
Chief Navigation Officer		1	1	1	1	1
Navigation Officer						
	Regular	3	3	1	1	1
	Disaster Prevention	1	1			
Quarter Master & Sailor						
	Regular	11	7	3	3	3
	Disaster Prevention	4	3	1	1	
Chief Engineering Officer		1	1	1	1	1
Engineering Officer						
	Regular	3	2	1	1	1
	Disaster Prevention	1	1			
Machinist's Mate						
	Regular	8	6	3	3	2
	Disaster Prevention	2	1			
Chief Communications Officer		1	1	1		
Communications Officers		3	2	1	1	1
Chief Supply Officer		1	1			
Supply Officer		1	1	1		
Commissary Man		5	3	1		
Total		47	35	16	13	11

(Reference: Table 7.1 Required Manpower)
1.08 = Rate of Reserved Crew

APPENDIX VIII

(Section 8 Development Plan)

8.1 Philosophy for Development Plan

Whatever plan is made, it must be built on the basis of a teleological argument through the distribution of such presentative prerequisites, so called, 5Ws/1H, by the approach from the inner truth, as places, persons, things, time, probability and methodology. This development plan should commence with the genesis like the above stated approach, too. In the major premise which is the Republic of Indonesia and its various minor propositions which shall be grasped from the inner angle and assimilated, a method/means is to be devised to this development plan based on the time proposed in the scope of work (S/W) and the present conditions of available resources as well as well-defined reasons for the said plan.

The development plan exists based on the aforementioned "Philosophy for Maritime Safety", particularly "Philosophy for Maritime Safety in Indonesia" where everybody has his/her own sole God, on whose will PANCASILA depends as a premise and is in esse as principle, and based on its ethos and/or soul the relevant laws and regulations are proclaimed and functioning.

Only it can be designated as the philosophy for the development plan in this Study to design future prospects through the inner distribution stipulated above, standing on necessity, possibility, probability and so on in light of the existing situations and taking into account the progress in the past.

8.2 Fifth Five-year Development Plan (Repelita V)

8.2.1 Short-term Development Plan in the Long-term Development Plan towards the Year 2005

The short-term development plan, that is, Repelita V for 5 years is outlined in the long-term development plan which was mapped out in the Master Plan of this Study for 17 years commencing with 1989 and terminating in 2005.

(1) Policy and Strategy

(i) Policies: The main policies of the short-term development plan are same as those of the long-term development plan and to establish the following systems.

- a) Maritime safety system(s) in accordance with development stages of the national economy
- b) The maritime safety system that enables autonomous development
- c) "Compact and efficient" system

(ii) Strategies: The undermentioned points are taken into account in the short-term development plan, i.e., Repelita V.

- a) To establish a minimal management system of maritime safety including structures and equipment urgently required, and
- b) To start training, R&D functions, which take a long time to accomplish.

(2) Major Plans

(i) Selection: The investment schedule "Plan 2" explained in the Interim Report (I/R) is adopted as the minutes of meeting (M/M) dated July 29, 1988 was signed by the representatives of both the nations for this study. The component projects of Repelita V are fundamental.

(ii) Projects: The items in Repelita V on the "Plan 2"

- a) Operation office : Command and central office
- b) Maritime safety rescue
 - ship : Rescue ships
 - Special rescue system : Station/communication equipment/materials
 - Disaster prevention : Equipment/materials

- c) Maritime SAR telecommunication : Equipment/materials
Traffic control system: Surabaya traffic control system
- d) Maritime safety training system : Facilities/equipment/training ship
- e) SAR overseas special training : (only a budget)

(3) Budget of the Development Plan

(i) Available Funds for Development Expenditure

a) Real GDP for the ensuing years towards the year 2005 is computed with the annual growth rate of 4% which was secured for a base.

b) Share of Development Expenditure in GDP:

The annual average share of GDP for the six years 1981 - 1986 is 12.0%.
(actual: 11.5%)

c) Share of the Communication & Tourism Sector in the Development Expenditures:

The annual average share of this sector's budget for the seven years 1981 - 1987 is 14%. (actual: 13.6%)

d) Share of Sea Transport Sector in the Communication & Tourism for 1981 - 1987:

With the same figures as used above, the annual average share of this sector in the budget for the same period can be calculated to be 18%.
(actual: 17.4%)

(ii) Amount of Development Budget(s) for Sea Transport:

The amounts are shown below.

Table A.8.1 Development Budget for Sea Transport towards 2005

Year	GDP (Rp. billion)	Share of Development Expenditure (%)	Share of Communication Sector (%)	Share of Sea Transport (%)	Amount of Sea Transport (Rp. billion)
1986	96,489.3	8.6	12.8	13.8	146.3
1987	110,171.5	-	16.6	12.5	161.0
1989	119,161.5	12.0	14.0	18.0	360.3
1993	139,402.1	12.0	14.0	18.0	421.6
1994	144,978.2	12.0	14.0	18.0	438.4
2005	223,187.2	12.0	14.0	18.0	674.9

Source: Statistik Indonesia 1984, 1985, 1986, 1987

(v) Total Amount of Development Budget(s) for Sea Transport

		(Rp. billion)
a)	1989-1993	Repelita V ----- Rp. 1,954.7
b)	1994-2005	12 years ----- Rp. 6,680.0
	Total	17 years ----- Rp. 8,634.7

The budget for the short-term plan in the Sea Transport Sector is Rp. 1,954.7 billion as listed above.

8.2.2 Plan in the Rolling Plan (May 1987)

Table 3-16 on the page III-78 of Konsepsi Kebijakan Repelita V Mei 1987 (hereinafter called "Rolling Plan") is summarized as follows.

Table A.8.2 Transport Sector (Total)

(Unit: Rp. billion)

Development Program	Source of Funds			Percentage (%)
	Domestic	Foreign	Total	
1. Sea transportation armada	45	1,649	1,694	56
2. Port	196	293	489	16
3. Maritime safety	244	500	745	24
4. Training/maritime sector training		92	92	3
5. Research and human resources		32	32	1
Total	485	2,566	3,052	100
Percentage (%)	16	84	100	

Source: Rolling Plan (Page III-78 Table 3-16)

(1) Policy and Strategy

(i) Policies: The ensuing items are defined as the whole policies.

- a) The actions to overcome short-term problems in parallel with the strategy of long-term development programs.
- b) Efficient utilization of funds and investment promotion without sacrificing any stability and expansion of a work opportunity.
- c) Export promotion of non-oil products
- d) Increment of efficiency of sailing companies' activities and port productivities by way of speeding up cargo handling activities, increasing trade activities and decreasing transportation cost through implementation of the governmental policy INPRES No. 4/1985 (Refer to "Original edition" Mei 1987 Pages III-2-5)

(ii) Strategies: The 7 actions are taken up as the main strategies.

- a) Maximizing utilization of armada, maritime safety facilities and port equipment
- b) Promoting execution of maritime safety regulations
- c) Developing services and operational productivity
- d) Increasing capacity

- e) Professionalizing human resources
- f) Improving internal and external coordination
- g) Improving a controlling system of operational management

(2) Major Plans

(i) Selection: The programs cover all the of the sea transport sectors as listed above on Table A.8.2 but are picked out only into the items pivoted on "maritime safety".

(ii) Projects: Selected projects and their investment estimations read as described below.

Table A.8.3 Source of Funds for Items in this Study

(Unit: Rp. billion)

Development Program	Necessaries	Source of Funds			Percentage (%)	Page of Data
		Domestic	Foreign	Total		
Seaworthiness/ harbour traffic control	Operational facilities	12.0	4.5	16.5	4.5	III-50
Navigation aid	Maritime telecom. facilities	20.0	103.0	123	36	III-56
Security/law & order/marine law/SAR aids	Ships/SAR equipment & telecom.	51.0	59.0	110	31	III-61
Maritime services/under- water works	Salvage equipment	7.0		7	2	III-66
Sea contamina- tion control	(No speci- fications)		2.0	2	0.5	-
Maritime sector training	Training facilities		92	92	26	III-75
Total		90	260.5	350.5	100	
Percentage		26	74	100		

Source: Selection from the Rolling Plan

8.2.3 Konsep Repelita V, Sub Sektor Perhubungan Laut Draft Ke III 15 Agustus 1988 (hereinafter called "Draft III")

Since no big change of the third revision for a draft concept of Repelita V is expected even though some alteration is made in part, the third revision draft (15 August 1988) is used as a reference for the Study as it is, in anticipation of a future minute adjustment.

(1) Policy and Strategy

(1) Policies (Pages 56-58 of the Draft III)

In connection with the conditions and main problems to be confronted during Repelita V in order that targets for the future may be achieved by a directed way, it is needed to decide a general policy of DGSC as follows.

a) In light of both the functions of the DGSC as a supporter to the other sectors and the activities being reflected in all the sectors and development fields, the policies are made based on the undermentioned items as a principle.

- a. Interactions among the production sectors
- b. Relations among the three (3) organizers
 - Users
 - Operators
 - Regulators

b) The policies aimed at:

- a. Organizing a sea communication system efficiently and effectively.
- b. Organizing investments directed (National Budget - State Enterprises - Private Sectors)
- c. Real tariff system
- d. Balancing on supply and demand

c) The structure of the abovementioned policies is expedient to touch strategic points, that is, to cover the fields of institution, operation and finance. The said policy formulation should be carefully characterized to:

- a. Capability of execution
- b. Maintenance of norm action
- c. Flexibility but stability

d) Investment indications during Repelita V are directed to:

- a. Increasing non-oil/gas export
- b. Increasing the efficiency and productivity
- c. Decreasing actions of the government step by step
- d. Adjusting/consulting with sub-sectors and other sectors
- e. Introducing quickly effectuated technologies at stages

(ii) Decision on Priority for Repelita V (Page 58 of the Draft III):

Based on the direction of the said policies, the priority programme of DGSC for Repelita V is determined as follows.

a) Ongoing activities (Carry-over) of Repelita IV (financed with a domestic fund as well as a foreign assistance to make them operational)

b) Increase of budgets for operation, maintenance and rehabilitation in the scheme of the optimal use of the existing facilities

c) Increase of new capacity with the priority of:

- a. Support of non-oil/gas export by the concrete way, for which an F/S was already reviewed, and design and technical specifications were available.
- b. Emphasis of distribution on the provinces of Eastern Indonesia

(iii) Strategies (Page 59 of the Draft III):

The fundamental strategies read as stated below. (Besides, the operational strategies are stipulated in the Draft III by sector like sea transport, harbour, maritime safety, and so forth and some part of them will be explained later if necessary).

Based on the policies and their directions mentioned above, the basic strategies of the DGSC which will be enforced comprise a combination between the strategies of stability and growth by way of the ensuing clauses.

- a) To maximize an effective level of fleet, facility and harbour equipment along with maritime safety
- b) To accomplish maritime safety regulations as much as possible
- c) To increase service quality, business productivity and operation
- d) To expand operation, maintenance and rehabilitation by the maximum utilization of the existing facilities
- e) To increase the capacity, taking into account the factors mentioned above
- f) To make human resources professionalized and cadre
- g) To enhance an external and internal coordination
- h) To enrich a control system and a constantly operational management

(2) Major Plans

(i) Selection (Page 82 of the Draft III)

In Repelita V, the maritime safety facility development is planned in the selection criteria of enhancement and expansion on safety cruise regulations, seaworthy ship control, proclamation and execution of the law at sea, navigation aid services and telecommunications and cleaning of the underwater hindrance.

(ii) Projects (Pages 75-77 of the Draft III)

It should be taken into consideration that those are targets.

Table A.8.4 Targets of Maritime Safety Sectors for Repelita V

Targets of Maritime Safety Sectors for Repelita V			
I. Seaworthiness & Port Order			
1. Port slips	(Unit)	:	55
2. Functional equipment	(Unit)	:	22
3. Maritime society information	(Province)	:	27
II. Navigation aid facility/Maritime Telecommunication and Supervision			
1. Navigation aid facilities	(Unit)	:	
a. Light signal tower		:	56
b. Light signal beacon		:	106
c. Light signal buoy		:	64
d. Day signal		:	192
e. Beacon radar		:	14
f. Medium wave beacon radio		:	8
2. Maritime telecommunication	(Location)	:	8
3. Beacon ships	(Unit)	:	33
III. Security, Control, Law Execution at Sea and SAR Support			
1. Sea and coast security unit	(Unit)	:	2
2. KPLP SAR functional equipment	(Unit)	:	55
3. Maritime SAR telecommunication system	(Location)	:	9
4. Contamination prevention equipment	(Unit)	:	4
IV. Maritime Services			
1. Refloatation of ship frames	(Location)	:	9
2. Ship maintenance	(Package)	:	33
3. Survey equipment, salvage and underwater works	(Package)	:	5
4. Ship speed-dredging equipment		:	3
V. Dredging			
System dredging/cruise line maintenance		:	18
/ Harbour		:	755 TM3
VI. Guidance and Facilities	(Unit)	:	24

Source: Table III-6 on Page 75 of the Draft III

Table A.8.5 Targets of Maintenance and Rehabilitation Program for Repelita V

1.	Increase of maintenance and rehabilitation of feeder harbours	(Location)	:	110
2.	Repair and maintenance of beacon ships	(Unit)	:	33
3.	Repair and maintenance of patrol ships	(Unit)	:	124
4.	Repair and maintenance of port ships	(Unit)	:	134
5.	Maintenance and rehabilitation of navigation aid facilities	(Unit)	:	1,072
6.	Repair and maintenance of maritime telecommunication	(Unit)	:	201
7.	Rehabilitation and maintenance of office buildings	(Pcs)	:	482
8.	Repair and maintenance of operational vehicles			
	- Cars		:	123
	- Motorcycles		:	184

Source: Table III-7 on Page 77 of the Draft III

(3) Establishment of a Budget

(i) GDP (Pages 68 - 69 of the Draft III):

Increment of Gross Domestic Products accelerates growth of social purchasing power.

Although the economic conditions of Indonesia are still no good due to the uncertainty of world economy, a good omen of recovery is observed for the future even if an economic growth is less than the growth level that is anticipated for Repelita V.

In Repelita V, an economic growth rate is projected to be 5% a year. To attain this growth rate, an annual average growth rate of economy in a communication sector is decided to be 5.2%. The economic growth rate of Indonesia (GDP) was 4% as of 1986, which is the newest period, according to the authorized data. (This was not 3.7% which had been stated in a World Bank report).

The fact (4%) in 1986 is higher than the estimate (3.9%) for an yearly economic growth rate in 1987. 1988 is anticipated to show around 4%, while the annual average economic growth rate of Indonesia for Repelita IV which will continue to March 31, 1989 is forecast to be below 5% in the same manner as what Repelita V is also considered.

(ii) Total Amount of Investment Funds for a Sea Communication (Page 86 of the Draft III)

The sum of investment amounts for Repelita V is estimated to be approximately Rp. 2.8 trillion, whose source of funds and breakdown are composed of the items listed below:

a) National budget (APBN) =	Rp. 1.685 trillion (61%)
(Breakdown)	
a. Carry-over (30%)	0.5055
b. Rehabilitation/Maintenance (16%)	0.2696
c. New items (54%)	0.9099
b) State-owned enterprises (BUMN) =	Rp. 1.074 trillion (39%)
Total	Rp. 2.759 trillion (100%)

(iii) Breakdown of budgets for Repelita V

Table A.8.6 Breakdown of Budgets for Repelita V

(Unit: Rp. billion)

Program	1989/1990		Repelita V		Total	Per-centage (%)
	National Budget	State-owned(*) Enterprise/Private	National Budget	State-owned(*) Enterprise/Private		
1. Armada	9	299/PM	45	805/PM	850	31
2. Harbour facilities	124	33	701	-	701	25
3. Maritime safety	22	-	694	70	764	28
4. Repair/maintenance/rehabilitation	27	-	245	199	444	16
Total	182	332	1,685	1,074	2,759	
Percentage (%)	35%	(514)	65%	(61%)	(39%)	100

Source: Draft III, August 15, 1988

(*) State-owned enterprise: - Perumpel (Public Port Corporation)
 - Perum Pengerukan (Public Dredging Corporation)

(iv) Rp. 2.7577 trillion (a slight difference between this amount and Rp. 2.759 trillion, though) consists of:

Domestic fund --- Rp. 1.1810 trillion (43%)

Foreign fund ---- rp. 1.5767 trillion (57%)

8.2.4 Overlapping Items in Concept Repelita V Draft III, 15th August 1988 and Draft Final Report (Interim Report Revised)

The following sectors are overlapped in part of the projects between the two documents on the subject.

(1) Maritime Safety Rescue Ships:

(i) Draft III : Class II ---- 2 ships

(ii) Draft Final Report: Class I-A --- 3 ships

Class I-B --- 2 ships

Class II ---- 2 ships

(2) Disaster Prevention:

- (i) Draft III : Oil skimmers/booms ----- 2 sets
Diving equipment ----- 4 (ports)
- (ii) Draft Final Report: Prevention materials
for Repelita V ----- 5 (places)

(3) Maritime Safety SAR Communication:

- (i) Draft III : Ongoing projects of Maritime SAR Communication
- (ii) Draft Final Report: EPIRB (Emergency Position
Indication Radio Beacon) ----- 6,600 pcs
MES (Message Exchange System) -- 8 (areas)

(4) Maritime Safety Training Center:

- (i) Draft III : Training Center in the DGSC (while Education in
Education Training Agency: ETA)
- (ii) Draft Final Report: Facilities/materials which are similar to those
of Interim Report (Ref. to Draft Final Report
for the Long-term Plan)

(5) SAR Overseas Special Training:

- (i) Draft III : This is included in ongoing projects
- (ii) Draft Final Report: Just an amount (Rp. 1.284 billion) listed

8.3 Short-term Development Plan in this Study

- (1) The items and their amounts are summarized as follows.

The total amount is Rp. 293 billion which is an accumulation of the sums of the respective projects mapped out in the respective sectors for the Short Term Development Plan (Repelita V) (The items are placed in the same order as listed on Page 41 of Progress Report II).

		(Unit: Rp. billion)
(i)	Maritime Safety Training Center	: Rp. 45.700
(ii)	Maritime Safety and SAR	: Rp. 173.206
	a) Maritime Safety Rescue Ships	: (Rp. 154.200)
	b) Mooring Pier	: (Rp. 0.492)
	c) Special Rescue System	: (Rp. 7.848)
	d) Disaster Prevention Materials	: (Rp. 10.665)
(iii)	Harbour Traffic Control System	: Rp. 37.021
(iv)	Maritime Safety SAR Communication and Information System	: Rp. 21.460
	a) EPIRB	: (Rp. 12.722)
	b) MES	: (Rp. 8.738)
(v)	Operation Office	: Rp. 13.918
	a) Large-sized SAR Console	: (Rp. 8.990)
	b) Medium-sized SAR Console	: (Rp. 2.115)
	c) Small-sized SAR Console	: (Rp. 2.813)
(vi)	SAR Overseas Special Training	: Rp. 1.284
<hr/>		
	Total	Rp. 292.588

(Exchange Rate: US\$1 = Rp. 1,670 = ¥130. Thus, Rp. 12.85 = ¥1)

(2) Amount and Allocation

(i) Allocation Ratio of the Budget

Compared the total of Items in this Study (Table A.8.3) with the total of the Sea Transport Sector (Table A.8.2), a share of the items (Rp. 350.5 billion) related to the short-term plan for maritime safety in this Study occupies 11.48% (11.5%) against the sum of the whole Sea Transport Sector (Rp. 3,052 billion).

(ii) Amount Allocated

Based on the abovementioned ratio, the budget for Repelita V is calculated as follows.

(Unit: Rp. billion)

- a) Sea communications sector (total) Rp. 1,954.7
- b) Items for this Study Rp. 224.8

(3) Comparison of the Total Amounts and the Amounts for Maritime Safety

Table A.8.7 Comparison of the Total Amounts and the Amounts for Maritime Safety

(Unit: Rp. trillion)

Document	Total	Maritime Safety (Total x 0.115)
1. Konsepsi Kebijakan Repelita V (Mei 1987)	3.052	0.351 (11.5%)
2. Konsep Repelita V Draft Ke III (15 Agustus 1988)	2.759	0.317 (11.5%)
3. Draft Final Report (December 1988)		
a) Amount Accumulated	-	0.293 -
b) Amount Allocated	1.955	0.225 (11.5%)
(Ref.) Rolling Plan Repelita IV (Mei 1987)	1.964	0.150 (8%)

(4) Factors to be Taken into Account

(i) Composition of Development Budgets

The budgets concerned are composed of the following (X), (Y) and (Z).

(a) Development Budgets

- a. Local portion/domestic fund ----- (X)
- b. Foreign portion/foreign assistance --- (Y)

(b) Routine/fiscal (operation/maintenance: O/M) budgets for:

- a. Respective organizations
- b. The development plans concerned ----- (Z)

(ii) Achievement Rates

Development budgets are appropriated for as revenue and expenditure in a national budget of the nation for respective fiscal years. Projects are not always completed in the period of a fiscal year but liable either to be extended over for some years or to be carried over to a next Repelita.

Although it may be accepted to check an accomplishment rate of the project by schedule, it is impossible to calculate an accurate rate of the project attainment in one lot among the projects which are scheduled to start and be completed at a different time. However, a plan requires a target of its advisable rate so that it is desired to grasp some figures even though they have less accuracy.

(a) Collective Achievement Rates

- a. The achievement rate of Repelita IV detailed in the Rolling Plan (May 1987) --- (Presumption): 41.45%
- b. The achievement rate of the five years 1984/85 - 1988/89 based on revenue and expenditure of the respective fiscal years --- (1988/89 to be presumed): 51.78%

(b) Examples of Individual Achievement Rates

a. The estimation of achieving rates for port facilities and equipment at 43 ports (4 gateways, 14 collector ports and 25 trunk ports) in Repelita IV

	<u>Target</u>	<u>Ach. Rate (Presumption)</u>
- Wharf	: 18,810 m	29%
- Warehouse	: 19,200 sq. m	28%
- Container yard	: 170,200 sq. m	40%
- Open storage	: 270,000 sq. m	44%

b. An achievement rate for port facilities in Repelita IV is estimated to be 48% (Reference is made to Page 36 of the Draft III)

c. An achievement rate for navigation aid facilities (SBNP) was targeted to be 40% but has actually reached 34% only. (Refer to Page 37 of the V Draft III)

In light of the facts described above, it must be said good that an achievement rate exceeds 50% in both a collective case and an individual case.

Funds for Repelita, which are appropriated for a portion of the national budget on an annually fiscal basis though, are different from the national budget of a fiscal year, whose accounts (revenue & expenditure) balance as a matter of course.

(iii) Ratio between Local Funds and Foreign Aid

It is impossible to make a uniform comparison between the local funds which can be appropriated one by one as needed in the national budget of a fiscal year and the foreign aid/assistance which has a variety of reimbursement time and amount through the various steps of procedures on both and between the sides of a donor country and a recipient country, and in addition to this, is influenced by an exchange rate which is fluctuating.

However, a clue to a ratio between both the portions is required for a plan in the same manner as the case of an achievement rate.

(a) Ratio to be adopted to this Study

In the discussions by and between the concerned of both the nations for this Study, it was proposed that a basic ratio between local and foreign portions for this Study shall be 16% and 84% respectively. (Refer to Table A.8.2 Sea Transport (Total) and Page III-78 on the bottom line of Table 3-16 in the Rolling Plan)

(b) Examples of other ratios

a. Repelita V (the basic ratio for this Study as stated above)

- Local portion : 16%
- Foreign portion : 84%

b. Repelita IV (Refer to Supporting Report of the long-term plan)

- National budget : 31%
- Foreign assistance: 69%

c. Items selected for this Study (Refer to the bottom line of Table A.8.3.)

- Domestic funds : 26%
- Foreign assistance: 74%

d. The Draft III

- Local funds : 43%
- Foreign aid : 57%

8.4 Conclusion

8.4.1 Propriety of the Methodology

This Study has been carried out to design future prospects with an analysis of the data in the past and a grasp of the present conditions. Since the premises as much as obtainable have been distributed, therefore, the methodology on the basis of a teleological argument is recognized to be right.

8.4.2 Propriety of the Budgetary Amount

The total amount of the budget for Repelita V which was amplified in calculation on the trend from the past to date is Rp. 224,791 million as already expatiated upon above. Thus, the amount of the budget/fund is methodologically reasonable.

8.4.3 Probability of the Cumulative Amount

In light of the study and investigation on the development plans from the past to date, it is unnoticable that special emphasis has been placed on the maritime safety sector in the development plans of the sea transport sector. This fact may be gathered from an allocation of the budget/fund for the maritime safety sector. Once special emphasis is laid on maritime safety, it is easily understandable even from a qualitative view that funds for the sector will be increased in addition to the amount on the trend described above in (2).

Therefore, probability for Repelita V exists with the cumulative amount meeting the number and volume of the plans proposed from the necessity, that is, Rp. 292,588 million.

8.4.4 Recommendation on Project Implementation

The following ways are recommended, though funds will be raised at the discretion of the executing organization/authorities.

(1) To implement all the items and/or projects proposed from each sector in this Study for the period of Repelita V, regarding the balance between the budgetary and cumulative amounts as an advance investment for the next Repelita.

(2) To examine which items and/or projects should be put aside at a minimum postponement to the next Repelita based on this Study, provided that the funds to be raised hardly be prospective enough to cover all the items and/or projects.

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