JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

DIRECTORATE GENERAL OF SEA COMMUNICATION, MINISTRY OF COMMUNICATIONS (DGSC) THE REPUBLIC OF INDONESIA

THE STUDY FOR THE MARITIME TRAFFIC SAFETY SYSTEM DEVELOPMENT PLAN IN THE REPUBLIC OF INDONESIA

FINAL REPORT

MAIN REPORT VOLUME 1

PART 1. : PRESENT STATUS, EVALUATION AND FUTURE DEMANDS

June 2002

THE JAPAN ASSOCIATION OF MARINE SAFETY(JAMS) JAPAN AIDS TO NAVIGATION ASSOCIATION(JANA)

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Exchange Rate in the Study:

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PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct a study on Maritime Traffic Safety System Development Plan in the Republic of Indonesia and entrusted the study to Japan International Cooperation Agency.

JICA selected and dispatched a study team headed by Mr. Kunio Tashima (until September 4th 2001) of The Japan Association of Marine Safety (JAMS) and Mr. Shingo Tsuda (from September 5th 2001) of JAMS, to Indonesia, three times between April 2001 and March 2002. In addition, JICA set up an advisory committee headed by Mr. Tamotsu Ikeda (Director, Radio Aids Division, Aids to Navigation Department, Japan Coast Guard) between March 2001 and March 2002, which examined the study from specialist and technical points of view.

The team held discussions with the officials concerned of the Government of the Republic of Indonesia and conducted field surveys at study areas. Upon returning to Japan, the team conducted further studies and prepared this Final Report.

I hope that this report will contribute to the promotion of the projects and to the enhancement of friendly relationship between the two countries.

Finally, I wish to express my sincere appreciation to the officials concerned with the Government of the Republic of Indonesia for their close cooperation extended to the study.

June 2002

Takao Kawakami President, Japan International Cooperation Agency

LETTER OF TRANSMITTAL

June 2002 Mr. Takao Kawakami President Japan International Cooperation Agency

Dear Mr. Kawakami

It is my great pleasure to submit herewith the Final Report of the Study for the Maritime Traffic Safety System Development Plan in the Republic of Indonesia.

The study team of the Japan Association of Maritime Safety (JAMS) and Japan Aids to Navigation Association (JANA) conducted surveys in the Republic of Indonesia over the period between April 2001 and March 2002 as per the contract with Japan International Cooperation Agency.

The findings of this study, which are compiled in this report, were fully discussed with the officials of the Ministry of Communications of the Indonesian Government and other authorities concerned to formulate the Maritime Traffic Safety System Development Plan in the Republic of Indonesia for the period up to the year 2020.

On behalf of the study team, I would like to express my heartfelt appreciation to the Government of the Republic of Indonesia, the Ministry of Communications and other authorities concerned for their diligent cooperation and assistance and for the heartfelt hospitality which they extended to the study team during our stay in the Republic of Indonesia.

I am also deeply indebted to "Japan International Cooperation Agency", "The Ministry of Foreign Affairs of Japan", "The Ministry of Land, Infrastructure and Transport of Japan" and "Embassy of Japan in Indonesia" for giving us valuable suggestions and assistance during the preparation of this report.

Yours faithfully,

Shingo Tsuda Team Leader, The Study for the Maritime Traffic Safety System Development Plan in the Republic of Indonesia

Concept of The Maritime Traffic Safety System Development Plan in the Republic of Indonesia



Global Maritime Distress and Safety System (GMDSS)



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ABBREVIATION LIST

Α	ADB	Asian Development Bank
	ADPEL	Administrator Pelabuhan
		(Port Administrator)
	ADSL	Asymmetric Digital Subscriber Line
	AIS	Automatic Identification System
	ALE	Automatic Link Establishment
	AMDAL	Environmental Impact Analysis
	AMVER	Automated Mutual-assistance Vessel Rescue
		System
	APBD	Anggaran Pendapadan Belanja Daerah / Area
		Income and Expenditure Estimate
	ARMADA PLP	Guard and Rescue Fleet
	ASDP	Angkutan Sungai Danau dan Penyeberangan
		(Ferry Transport Services)
В	BAKOSURTANAL	National Mapping and Survey Coordination
		Agency
	BAPEDAL	Environmental Impact Management Agency
	BAPPENAS	Badan Perencanaan Pembangunan Nasional /
		National Development Planning Agency
	BAPPEDA	Badan Perencayaan Pembangunan Daerah /
		Institute of Province Development Plan
	BASARNAS	Badan SAR Nasional (National SAR Agency)
	BKN	Badan Kepegawaian Nasional / State Personnel
		Institution
	BOD	Biological Oxygen Demand
	BPS	Central Bureau of Statistics
	BTKP	Maritime Safety Technological Center
	BUMN	State Owned Enterprise
С	CBNA	Capacity Building Needs Assessment study
	CD-ROM	Compact Disk Read-only Memory
	CGI	Consultative Group on Indonesia
	CIDA	Canada International Assistance Agency
	CLGS	Community and Local Government Support
	COD	Chemical Oxygen Demand
	CS	Civil Society

D	DAK	Dana Alokasi Khusus / Special Allocation Fund
	DAU	Dana Alokasi Umum / General Allocation Fund
	DBS	Direct Broadcasting Service
	DC	Direct Current
	DC/DC	DC/DC Converter
	DGLC	Directorate General of Land Communication,
		Ministry of Communications
	DGNSS	Differential Global Navigation Satellite System
	DGPS	Differential Global Positioning System
	DGSC	Directorate General of Sea Communication,
		Ministry of Communications
	DISNAV	District Navigation Office
	DKI	Daerah Khusus Ibukota
	DM	Deutsche Mark(s)
	DPOD	Dewan Pertimbangan Otonomi Daerah / Local
		Autonomy Consulting Committee
	DSC	Digital Selective Call
	DSI	Daftar Suar Indonesia (List of Lights in
		Indonesia)
	DWT	Dead Weight Tonnage
E	E/G	Engine Generator
	EIRR	Economic Internal Rate of Return
F	FIRR	Financial Internal Rate of Return
G	GAMAT	Directorate of Guard and Rescue
	GBHN	Garis-garis Besar Haluan Negara
		(State Policy Guide Lines)
	GDP	Gross Domestic Product
	GEO	Geo-stationary Orbit
	GNP	Gross National Product
	GMDSS	Global Maritime Distress and Safety System
	GOI	Government of the Republic of Indonesia
	GOJ	Government of Japan
	GPS	Global Positioning System
	GRDP	Gross Regional Domestic Product
	GT	Gross Tonnage

	GTZ	Dautsche Gesellschaft fur Technische Zusammenarbeit
Н	HBM	Harbor Master Office
	HF	High Frequency
Ι	IALA	International Association of Marine Aids to
		Navigation and Lighthouse Authorities
	IMO	International Maritime Organization
	IMF	International Monetary Fund
	IP	Internet Protocol
	IPC	Indonesia Port Corporation
	IPP	Independent Power Producer
	IT	Information Technology
	ITU	International Telecommunication Union
J	JAMS	The Japan Association of Marine Safety
	JANA	Japan Aids to Navigation Association
	JBIC	Japan Bank for International Cooperation
	JICA	Japan International Cooperation Agency
K	KANPEL	Kantor Pelabuhan (Port Office)
	KANWIL	District Office of Ministry of Communication
	KfW	Deutsche (German) Bank of Reconstruction
	KKN	Kolusi, Korupsi dan Nepotism / Collution,
		Corruption and Nepotism
	KM	Minister Decree
L	LAN	Lembaga Administrasi Negara / National Institute of Administration
	lat. or Lat.	Latitude
	LH	Lighthouse
	LOI	Letter of Intent
	long. or Long.	Longitude
	LOX	Local Exchanger
М	MEFP	Memorandum of Economic and Financial Policy
	MENPAN	Menteri Negara Pendayagunaan Aparatur Negara / State Minister for Utilization of State Apparatus

	MF	Medium Frequency
	MFB	Medium Wave Radio Beacon
	MOC	Ministry of Communications
	MSC	Maritime Safety Committee
	MOF	Ministry of Finance
	MP	Master Plan
	MTBF	Mean Time Between Failure
	MTTR	Mean Time To Repair
Ν	NAVAREA	World-wide Navigation Warning Service Area
	NAVIGASI	Directorate of Navigation
	NAVTEX	Navigation Telex
	NBDP	Narrow Band Direct Printing
0	OJT	On the Job Training
	ODA	Official Development Assistance
	ORBCOMM	Orbital Communications
Р	Р.	Pulau (Island)
	PAP	PT Angkasa Pura (Airport Corporation)
	PC	Personal Computer
	PCA	The People's Consultative Assembly
	PDPP	Program Daerah Pembangunan Perkotaan
		(Regional Program for City Development)
	PELNI	Pelayaran Nasional Indonesia (Indonesian
		National Shipping Lines)
	PELINDO	Indonesian Sea Port Corporation
	PLN	Perusahaan Listrik Negara
	PNBP	Non-Taxation State Revenue-Light Dues
	PP	Peraturan Pemerintah (Government
		Regulation)
	PROPENAS	National Development Program
	PT.	Perseroan Terbatas (Corporation)
	PUMDA	Pekerjaan Umum Daerah
	PUOD	Pemerintah Umum dan Otonomi Daerah
R	RACON	Radar Beacon
	RC	Reinforced Concrete
	REPELITA	National Five-year Development Plan
	RLB	Resilient Light Beacon

	Ro-Ro	Roll on Roll off type vessel
	Rp.	Rupiah
	RR	Radio Regulation
	RS	Reference Station
S	SA	Selective Availability
0	SAPS	Special Assistance for Project Sustainability
	SAR	Search and Rescue
	SDP	Sector Development Program
	SEDM	Supprt for Decentralization Measures
	SISTRANS	The National Transport Development Plan
	SOLAS	IMO International Convention for the Safety of
	DOLING	Life at Sea
	SROP	Coastal Radio Station
	SS	Solid Suspense
	SSB	Single Side Band
	STCW	International Convention on Standards of
		Training, Certificates and Watchkeeping for
		Seafarers
Т	TEU	Twenty Foot Equivalent of Unit
_	TG	Telegraph
	Tg.	Taniung : Cape
	TLK	Teluk : Bay. Cove. Gulf
	TP	Telephone
	TSS	Traffic Separation Scheme
	TSSS	Transport Sector Strategy Study in Indonesia in
	1000	2000
	ТХ	Transmitting Station or Transmitter
U	Uj.	Ujung : top, Point
	U.K.	United Kingdom (of Great Britain and Northern
		Island)
	UKL	Environmental Management Effort
	ULCC	Ultra Large Crude oil Carrier
	UNCLOS	United Nations Convention of the Law of the
		Sea
	UNDP	United Nations Development Plan
	UPL	Environmental Monitoring Effort
	UPT	Technical Planning Unit
	USAID	United States Agency for International Development
---	-------	---
V	VHF	Very High Frequency
	VLCC	Very Large Crude oil Carrier
	VSAT	Very Small Aperture Terminal
	VTIS	Vessel Traffic Information Services
	VTMS	Vessel Traffic Management Services
	VTS	Vessel Traffic Service
W	WARC	World Administration Radio Conference
	2drm	2 distance-root-mean-squares

CHAPTER 1.

INTRODUCTION

CHAPTER 1. INTRODUCTION

1.1. Background of the Study

The development of aids to navigation and maritime telecommunications system in Indonesia has been implemented based on the master plans which were formulated in March 1982 and in October 1985 by JICA and, had covered up to year 2000.

Since then there have still been great demands for extension and improvement of aids to navigation coming from the sea lanes which were newly established according to UNCLOS and other vessel traffic routes as a result of steady increase of marine activities in Indonesia. Especially the Straits of Malacca and Singapore where TSS has been established are crucial sea lanes for vessels carrying dangerous substances such as crude oil carriers.

On the other hand, demands for expansion and upgrading of maritime telecommunications system to meet international requirements are imminent for outdated existing facilities.

In this regard, GOI has been in need of the master plans of both fields of aids to navigation and maritime telecommunications systems as **"The Study for the Maritime Traffic Safety System Development Plan**" (hereinafter referred as **"the Study**") which covers up to the target year of 2020.

In response to the request of GOI, GOJ decided to conduct the Study on the Development Plan in accordance with the relevant international / internal laws and regulations in force in Indonesia .

JICA, which is the official agency responsible for the implementation of the technical cooperation programs of GOJ, sent Preliminary Survey Team in November 2000 to conclude the Scope of Work and its Minutes of Meeting, which were mutually agreed on November 13th 2000 between DGSC and JICA.

The JICA Study Team (hereinafter referred to as "**the Study Team**") was organized by JAMS and JANA in March 2001 and formulated Inception Report in advance of commencing implementation of the Study in Indonesia.

JICA dispatched the Study Team headed by Mr. Kunio TASHIMA to Indonesia on April 22nd 2001 to conduct the Study.

1.2. Objectives of the Study

The objectives of the Study are:

- (1) To formulate the master plans for aids to navigation and maritime telecommunications system up to the target year of 2020;
- (2) To formulate the short term plans up to the target year of 2007;
- (3) To select priority projects from the short term plans and to implement feasibility studies for the selected projects;
- (4) To make recommendations about education/training, operation/maintenance and other matters related to the maritime traffic safety system;
- (5) To transfer technology related to the Study through seminars and counterpart training.

1.3. Organization of Steering Committee and Counterparts

At the beginning of the Study, DGSC presented the Steering Committee and the Counterpart Members who were organized by related GOI officials as shown in **Table 1.1.** and **Table 1.2**.

1. Leader	Director General of Sea Communication		
2. Sub Leader I	Secretary General of DGSC		
3. Sub Leader II	Director of Navigation		
4. Secretary	Sub Director of Fleet and Equipment, Directorate of Guard &		
	Rescue		
5. Member	Head of Planning Bureau, DGSC		
6. Member	Head of Financial Bureau, DGSC		
7. Member	Head of Communication and Telecommunication, BAPPENAS		
8. Member	Director of Sea Transport Traffic, DGSC		
9. Member	Director of Marine Safety and Seafarers, DGSC		
10. Member	Director of Guard and Rescue, DGSC		
11. Member	Head of Research & Development for SEACOM, MOC		

Table 1.1. Member of Steering Committee

1. Leader	Head of Research & Development for SEACOM, MOC
2. Sub Leader	Head of Planning Division, DGSC
3. Secretary	Ir. T. Sitorus / Directorate of Navigation
4. Secretary	Ir. Adolf R Tambunan, MSc./ Planning Division, DGSC
5. Member	Sub Director of Aid to Navigation, Directorate of Navigation
6. Member	Sub Director of Telecommunication Service, Directorate of
	Navigation
7. Member	Sub Director of Port Facilities, Directorate of Navigation
8. Member	Sub Director of State Shipping, Directorate of Navigation
9. Member	Head of Financial Division, DGSC
10. Member	Sub Director of Patrol and SAR, Directorate of Guard and Rescue
11. Member	Efrizon / Directorate of Guard and Rescue
12. Member	Drs.Petrus Sumarsono, Akt.,MA./BAPPENAS
13. Member	Ikhwan Hakim, ST,SMT./ BAPPENAS
14. Member	Ir. Tulus Hutagalung, MT / Directorate of Navigation
15. Member	Drs.Chamdani, MM / Directorate of Navigation
16. Member	Ir.Bambang Wiyanto, MM/ Directorate of Navigation
17. Member	Capt. Surono, MM/ Directorate of Guard and Rescue
18. Member	Ir.Supardi / Directorate of Navigation
19. Member	Ir.M.Ali Malawat / Directorate of Navigation
20. Member	Ir.Raymond I.H.A.S./ Directorate of Navigation
21. Member	Sahat, SH, MH./ Law Section
22. Member	Erwin Pangaribuan, SE, M.Sc./ Directorate of Sea Transport Traffic
23. Member	Ir.Budi Indrayanto / Directorate of Sea Transport Traffic
24. Member	Dian Lesmana / Directorate of Marine Safety and Seafarers
25. Member	Capt. Sony Ichsan / Directorate of Port and Dredging
26. Member	Ir.Ronald Simanungkalit, DESS / Planning Division, DGSC
27. Member	Drs.Berenhard, MT. / Planning Division, DGSC
28. Member	Viva Indrayani Ayu, ST. / Planning Division, DGSC
29. Member	Rawat PG., ST. / Planning Division, DGSC
30. Member	Assistant of Planning Bureau, MOC
31. Member	Assistant of Department of National Affairs and Local Government
32. Secretary	Samsul Bahri, S.Sos. / Directorate of Navigation
33. Secretary	Dedi Sutisna / Directorate of Navigation

Table 1.2. Member of Counterparts

1.4. Organization of the Study Team

The Study Team was comprised of Team Leader Mr. Kunio TASHIMA (relieved by Mr. Shigo TSUDA on Sep.5th 2001) and other 17 experts. Their names and responsibilities are shown in **Table 1.3**.

1. Team Leader	KUNIO TASHIMA		
Relieved on September 5 th 2001 by	Shingo TSUDA		
2. Economic Analysis, Financial Analysis,	Yoshioki MATSUSHITA		
Demands Forecast			
3. Natural Condition, Environment Impact	Masaaki SAITO		
Assessment			
4. Maritime Traffic Safety System Planning,	Tetsuro IKEZAKI		
Seminar Planning, Coordinating			
5. Maritime Traffic, Fishing and Maritime	Shigeki WATAMORI		
Accidents Survey / Analysis, Coordinating			
6. Enhancement of Operation and Maintenance	Kazuaki SHITSUKAWA		
System, Education and Training of Personnel			
7. Maritime Telecommunications System	Hidetaka MORIYAMA		
(Planning)			
8. Maritime Telecommunications System (Cost	Kiyoshi WATANO		
Estimate)			
9. GMDSS	Noboru MIHARA		
10. Equipment and Facilities of Visual Aids to	Makoto NIKAIDO		
Navigation (Cost Estimate)			
11. Equipment and Facilities of Visual Aids to	Naoki WASHIYAMA		
Navigation (Cost Estimate)			
12. Management of Visual Aids to Navigation	Shintaro HASHIMOTO		
13. Equipment and Facilities for Radio Aids to	Yasunobu YAMANE		
Navigation			
14. GPS Measurement	Hideo SASAKI		
15. GPS Needs Survey	Mitsuo KUBO		
16. VTS (Planning)	Mitsumasa NOGUCHI		
17. VTS (Cost Estimate)	Juji MATSUSHIRO		
18. Supporting Facilities of Aids to Navigation	Kazuhiro WATANABE		

Table 1.3. Members of the Study Team

1.5. Governmental Organization Related to the Study

1.5.1. Ministry of Communications

The existing Maritime Traffic Safety System in Indonesia is undertaken by DGSC under the Ministry of Communication (MOC).

MOC, in accordance with Presidential Decrees No.44/1974 and No.45/1974, is responsible for the formulation and execution of Government policies, and the planning and implementation of development programs for all aspects of transport sector operation and development.

MOC consists of four (4) Directorate Generals and three (3) Agencies and one (1) Secretary General Bureau as of January 2002. The organization chart of MOC is shown in **Figure 1.5.1**.

The four (4) Directorate Generals are DGSC, Directorate General of Land Communications (DGLC), Directorate General of Air Communications (DGAC) and Directorate of General of Post and Telecommunications (DGPT).

DGLC is responsible for regulating the inland waters and ferry traffic and transport industry as well as other land transport industry. The organization chart of DGLC is shown in **Figure 1.5.2**.

DGAC is the national authority responsible for civil aviation in Indonesia, and the agency has been designated to represent Indonesia under the Chicago Convention of 1944 governing international civil aviation. DGPT joined MOC in 1998.

In addition to four (4) Directorates General, three (3) Agencies belong to MOC. National Search and Rescue Agency (BASARNAS) is one of the three (3) Agencies and is responsible for SAR coordination activities as Rescue Coordination Center (RCC) covering the land, marine and air domains of Indonesia.

The Secretary General Bureau consists of Planning, Personnel, Finance, Equipment, Legal Affairs and General Affairs Division.

1.5.2. DGSC

(1) Central Organization

DGSC consists of the Secretary General and five (5) Directorates in charge of actual operation works as follows;

Secretariat of Directorate General

Directorates

a. Directorate of Navigation

This Directorate takes control of the services related to installation, operation and maintenance of aids to navigation equipment and maritime telecommunications system.

The organization chart is shown in **Figure 1.5.4**.

b. Directorate of Guard and Rescue

This Directorate takes control of the services related to marine rescue, prevention of marine disasters, law enforcement, maintenance of traffic order and guidance of salvage and other marine works.

The organization chart is shown in **Figure 1.5.5**.

- c. Directorate of Marine Safety
- d.Directorate of Ports & Dredging
- e. Directorate of Traffic & Sea Transportation

The organization chart of DGSC is shown in Figure 1.5.3.

(2) District Organization

Since 1988 (KM No.64/88), MOC had been represented by 27 regional offices known as **KANWIL** which contained technical implementation offices (UPT) for land, sea and air communications. These offices worked together with the port (PELINDO), airport (PAP) and ferry (ASDP) companies.

The position of **KANWIL** was abolished under the Law No.22/99 and it is understood that their functions will be undertaken by the provincial administrations. Organization chart of district office of MOC is shown in **Figure 1.5.6**.

Port Administration Office (ADPEL)

The port administration services are under the control of Port Administrator Office (ADPEL: Administrator Pelabuhan) which was one of the subordinate offices of abolished KANWIL, and the dedicated ports are under the control of Port Office (KANPEL: Kantor Pelabuhan). As of Dec. 2001, ADPEL and KANPEL are directly controlled by the Central Government as a temporary step.

However, four ports, Tanjung Priok (Jakarta), Belawan (Medan), Surabaya and Ujun Pandang (Makassar) are directly controlled by Director General of Sea Communications as Port Administrator (ADPEL) of 1^{st} class ports as before and the provisional organization chart is shown in **Figure 1.5.7**.

Fleet Bases (ARMADA PLP)

The rescue and security at sea (exclusive of ports) within the entire territory of Indonesia are maintained by five (5) fleet bases (ARMADA PLP) at Tanjung Priok, Tanjung Uban, Surabaya, Ambon and Bitung. The organization chart is shown in **Figure 1.5.6**.

District Navigation Office (Distrik Navigasi)

For the local administration of the Directorate Navigation, 24 District Navigation Offices (Distrik Navigasi) are established under the DGSC. Several functional groups of experts of beacon (Perambuan), coastal radio stations (Stasiun Radio Pantai), ship's crew (Kapal Negara) and sea watchkeeping (Pengamat Laut) are stationed at each District Navigation Office. The coastal stations deployed in the entire country are keeping watch of distress signals.

The organization chart is shown in **Figure 1.5.8**.

National Search and Rescue Agency (BASARNAS)

BASARNAS consists of 19 rescue coordination centers (6 of Type A and 13 of Type B), which are coordinating SAR activities among related organizations in each district as shown in **Figure 1.5.9**.



Figure 1.5.1. Organization of Ministry of Communications



Figure 1.5.2. Organization of Directorate General of Land Communication

Figure 1.5.3. Organization of Direc torate General of Sea Communication (DGSC)





Figure 1.5.4. Organization of Directorate of Navigation



Figure 1.5.5. Organization of Directorate of Guard & Rescue





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Figure 1.5.7. Port Administrator (Class 1)





Figure 1.5.8 Organization Chart of District of Navigations (DISNAV)

Figure 1.5.9 National Search and Rescue Agency (BASARNAS) District Office



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1.6. Progress of the Study

1.6.1. Implementation Records during 1st Work in Indonesia (1) General

The 1st Work in Indonesia was actually commenced on April 22nd 2001. The contents of Inception Report were explained and discussed on the 1st Steering Committee Meeting held on April 23rd and 24th 2001. The Minutes of the Meeting were mutually agreed and signed by Mr. Kunio TASHIMA, leader of the Study Team and Ir. Tjuk SUKARDIMAN, MSi, Director General of Sea Communications, on April 24th 2001.

During this work period in Indonesia, the Study Team compiled the Progress Report No.1 and submitted 30 copies to GOI. The contents of the report were explained to the participants in the Counterpart Meeting held on July 11th 2001 at DGSC meeting room.

(2) Site Survey Record

The Study Team was divided into three teams of Marine Traffic Team, Aids to Navigation Team and Telecommunications Team. Each team was also divided into several groups and implemented site surveys accompanied by counterpart officers. The locations of site areas are shown in **Figure 1.6.1**.

The site survey areas were finally decided on whether they are allowed to visit or not, based on the JICA's Safety Management Standard. Especially, visits to Sabang, Sibolga, Ambon, Jayapura, Solong and Merauke were cancelled or unplanned to implement site survey by the Study Team.

Marine Traffic Team

The team visited Tanjung Pinang, Kijang, Tanjung Uban, the Strait of Singapore, Tanjung Priok, Dumai, Belawan, Padangbai and Benoa to investigate the port situation and to collect the statistical data of the port. The team also carried out marine traffic density survey in Sunda Strait and Lombok Strait for continuous 48 hours by chartering KPLP and Navigasi vessels.

Telecommunications Team

The team divided into two groups and visited Tanjung Pinang, Tanjung Ubang, Dumai, Palembang, Tanjung Priok, Benoa, Kupang, Belawan, Ujung Pandang, Manado, Teluk Bayur, Semarang, Surabaya, Balikpapan, Samarinda, Banjarmasin and Cilacap. Visits to Jayapura and Sorong were cancelled by the Study Team in consideration of JICA's Safety Management Standard.

The Study Team collected necessay data of the maritime telecommunications facilities to establish inventory system, etc.

Aids to Navigation Team

The team also divided into four groups and visited Semarang, Ujung Pandang, Tanjung Pinang, Benoa, Kupang, Surabaya, Kendar, Palemban, Tanjung Priok, Bitung, Tarakan, Samarinda, Cilacap, Belawan, Dumai, Pontianak, Banjarmasin and Kupan. Visiting Solong was cancelled by the Study Team in consideration of JICA's Safety Management Standard.

The team measured GPS positioning at Tanjun Priok and also collected necessary data of aids to navigation facilities to establish inventory system, etc..



Figure 1.6.1. Location of Site Survey during 1st Work in Indonesia

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Cancelled or Unplanned to visit

1.6.2 Implementation Records during 1 st Work in Japan

During this work period in Japan, the Study Team formulated the master plans up to year 2020 and the short term plans up to year 2007. The six(6) priority projects were selected from the short term plans. The Interim Report was compiled at the last stage of this work period.

Mr. Kunio TASHIMA , leader of the study team, was relieved by Mr. Shingo TSUDA on the date of September 5^{th} 2001 due to ex-leader's private affair.

1.6.3. Implementation Records during 2 nd Work in Indonesia (1) General

JICA sent most members of the Study Team headed by Mr. Shingo TSUDA to Indonesia again on October 1^{st} 2001 to continue the study.

The contents of the Interim Report were explained by the Study Team in the 2^{nd} Steering Committee Meeting held on Oct. 3^{rd} 2001. The Minutes of the Meeting were mutually agreed and signed by Mr.Shingo TSUDA, leader of the study team and , Capt.Mardowo, Sub Leader II, Steering Committee, on behalf of Sea Communication, Ministry of Communications, on October 5^{th} 2001.

After the approval of the six priority projects in the Steering Committee, the Study Team prepared Inception Reports for each priority project upon request from GOI. The Counterpart Meeting was held on October 9th 2001 and discussed the contents of the Inception Reports of priority projects.

The Minutes of the Meeting were mutually agreed and signed by Mr.Shingo TSUDA, leader of the study team and Mr.Tonny Budiono, Leader of Counterpart Team, Directorate General of Sea Communications.

The Study Team started to implement the feasibility studies according to the Inception Reports of the six priority projects.

The Seminar No.1 was held jointly by JICA and DGSC on November 14th 2001. There were a total of 69 participants of Indonesian and Japanese including the Study Team members.

The 1st Counterpart Meeting on the Progress Report No.2 to discuss the contents related to telecommunications and educational matters was held on November 20th 2001 due to the restricted duration of the Study Team

members concerned.

The Minutes of the 1st Meeting were mutually agreed and signed by Mr.Shingo TSUDA, leader of the study team and Mr.Tonny Budiono, Leader of Counterpart Team, Directorate General of Sea Communications.

In the final stage of 2^{nd} Work in Indonesia, the Study Team compiled the Progress Report No.2.

The 2^{nd} Counterpart Meeting on the Progress Report No.2 was held on December 3^{rd} 2001 to discuss the whole contents of the Progress Report No.2. The Minutes of the 2^{nd} Meeting were also mutually agreed and signed the same as the 1^{st} Meeting.

(2) Site Survey Record

The Study Team was divided into three(3) teams of Marine Traffic Team, Aids to Navigation Team and Telecommunications Team the same as in 1st Work in Indonesia. Each team was also divided into several groups and total seven groups were implemented site surveys accompanied by counterpart officers.

The site survey areas were finally decided on whether they are allowed to visit or not by the Study Team based on the JICA's Safety Management Standard the same as in 1st Work in Indonesia. Especially, visits to Makassar and Kendari were cancelled due to hazardous situations in the areas at that time.

Marine Traffic Team

The team visited Bitung and Tanjung Priok to carriy out marine traffic density survey in Sea Lane III area between Mayu Island and Halmahera and Sunda Strait for continuous 48 hours by chartering Navigasi and KPLP vessels.

Telecommunications Team

The team was divided into two(2) groups and visited Medan, Surabaya, Benoa, and Bitung. The team collected necessary data of the maritime telecommunication facilities to establish inventory and implemented feasibility study.

Aids to Navigation Team

The team was divided into four(4) groups of two(2) Aids to Navigation groups, DGPS group and VTS group. The Aids to Navigation groups visited Dumai, Bengkanis, Tanjung Pinang, Terenpa, Kuala Tungkal, Kuala Emok, Palembang Muntok and islands of North Sulawesi and Jakarta for surveying aids to navigation facilities. VTS group visited Meraku, Annyar, Pulau Rimaubalak in Sunda Strait and Tanglad, Gili Selang, Padanbai, Sungiggi, Mangsi, Bankobangho and Lember in Lombok Strait for surveying VTS radar sites proposed. DGPS group visited Pekanbaru, Semarang, Surabaya and Pontianak for surveying DGPS stations proposed.

The team continuously measured GPS positioning at Tanjung Priok.

- **1.6.4. Implementation Records during 2** nd **Work in Japan** The Study Team compiled the report as the Draft Final Report after reviewing the contents of Progress Report No.1 / No.2 and Interim Report.
- **1.6.5. Implementation Records during 3** rd **Work in Indonesia** JICA sent a total of nine(9) members of the Study Team headed by Mr.Shingo TSUDA to Indonesia for the third time on March 10th 2002 to continue the Study.

The contents of the Draft Final Report were explained by the Study Team in the 3rd Steering Committee Meeting held on March 13th 2002. The Minutes of the Meeting were mutually agreed and signed by the Study Team and GOI.

The Seminar No.2 was held jointly by JICA and DGSC on March 20th 2002 at SRIWAJAYA Meeting Room in DGSC.

1.6.6. Implementation Records during 3rd Work in Japan

During 3rd Work in Japan, the Draft Final Report was revised based on the request from GOI. The Study Team finalized the study work to compile the Final Report.

The study records up to the end of the Study are shown in **Figure 1.6.2**.

Fiscal Year of 2000 F.Year of 2002 Fiscal Year of 2001 12 2 3 9 10 11 12 5 5 6 7 8 2 3 4 6 4 1st F.Year 2nd Fiscal Year **3rd Fiscal Year** 1st Work in Indonesia 3rd Work in Indonesia 2nd Work in Indonesia Work in Indonesia 2nd Work in Japan Preparatory Work in Japan 1st Work in Japan 3rd Work in Japan Work in Japan **...** **Inception Report** 24 (Steering Committee) **Progress Report** 11 (Counterpart Meeting) Interim Report 3_1 (Steering Committee) **Inception Report for Priority Projects** 10 (Counterpart Meeting) Seminar for Transferring 14 20 Technology **Draft Final Report** (Steering Committee) Final Report (Submission)

Figure 1.6.2. Record of the Study W ork

1.7. Entrusting to Local Consultants

Aiming at fast and smooth implementation of the Study local consultants were entrusted with regards to following surveys.

1.7.1. Establishment of Inventory for DGSC 's Telecommunications Facilities As a task of the telecommunication team, for ensuring each coastal station's or district function's telecommunication equipment and materials, and for grasping their operational condition, preparation work for inventory of DGSC 's telecommunications facilities has been given to the team. To execute the task, a local consultant was employed.

A contract called "Agreement on Engineering Services for Drawing Up The Inventory of The Maritime Telecommunication Facilities" was concluded with the local consultant in Jakarta on May 3, 2000, and the services were completed on November 14, 2001.

1.7.2. Establishment of Inventory for Aids to Navigation Facilities A local consultant was entrusted to establish a inventory for aids to navigation facilities that belong to DISNAV. This Inventory List was also completed at the end of November 2001.

1.7.3. GPS (Including DGPS) Needs Survey

A qualified local consultant was entrusted to carry out the survey of GPS (including DGPS) needs. This survey was completed at the end of August 2001.

1.7.4. Environmental Assessment

According to the Indonesian standards for the environmental study, it is reasonable that the standards of environmental study for the harbor construction project should be applied correspondingly to the Study.

Also, it is mentioned in the environmental study standards for the harbor construction project that the study of Environmental Management Effort (UKL) and the Environmental Monitoring Effort (UPL) should be applied for the construction of middle-scale berths.

The contract with the local consultant about implementation of UKL and UPL for the selected sites of priority projects was made at the beginning of December 2001 and the survey was completed at the beginning of February 2002.

CHAPTER 2.

PRESENT STATUS

CHAPTER 2. PRESENT STATUS

2.1. Socio-economic Conditions

2.1.1. National Economic Indices

(1) National income

There is a clear difference between Gross Domestic Product (GDP) and National Income. For example, it is desirable to know national income per capita for the purpose of grasping the living level in Indonesia. National income means that Gross National Product (GNP) minus net indirect taxes and depreciation. It is shown in **Table 2.1.1**. National income increased by 8.71 % in 1996, 3.31 % in 1997, but sharply decreased by 11.44 % in 1998 due to the economic and financial crisis. In 1999, it increased only by 0.14 %.

Table	2.1.1.	National	Income

			Unit: Bil	lion Ruplan
	1996	1997	1998	1999
National Income	358,151.6	370,020.5	327,693.7	328,151.9
Growth rate	8.71 %	3.31 %	-11.44 %	0.14 %

Based on 1993 Constant Prices

Sour c e: Statistical Year Book of Indonesia, 1999

(2) Production

Production is shown by GNP and GDP. Recently GDP is generally used. Therefore in this report, GDP shall be used. According to "The Statistics Indonesia by Central Bureau of Statistics (BPS)", GDP increased by 7.5 % in 1994, 8.2 % in 1995, 7.8 % in 1996, 4.7 % in 1997 and decreased by 13.1 % in 1998 due to the economic crisis. Then GDP increased by 0.8 % in 1999 and 4.8 % in 2000. GDP value from 1994 to 2000 is shown in **Table 2.1.2**.

Table 2.1.2. GDP at 1993 Constant Prices

Unit:	Billion	Rupiah

	1994	1995	1996	1997	1998	1999 *	2000**
GDP	354,640.8	383,792.3	413,797.9	433,245.9	376,374.9	379,557.7	397,666.3
Growth rate	7.5 %	8.2 %	7.8 %	4.7 %	13.1 %	0.8 %	4.8 %

Remark: *; Preliminary Figure, **; Very Preliminary Figure

Source: 1) Statistical Year Book of Indonesia, 1999, BPS

2) Annual Report 2000, Bank of Indonesia

(3) Trade

The growth of Indonesian export was still occupied by oil and gas up to 1986. Since then production and export of non-oil commodities have improved and increased because of the new deregulation and policies. It gave a significant impact on non-oil export. In 1998, the value of non-oil and gas export reached 83.88 % of the total Indonesian export. But it dropped 79.88 % in 1999 due to the economic crisis.

At the same time, the total value of Indonesian export decreased by 0.37 % from the 1998. The economic and financial crisis also influenced the value of Indonesian import. Since 1997, the value of Indonesian import has been decreasing. The Rates of decrease were 34.4 % in 1998 and 12.19% in 1999. Trend value of exports and imports are shown in **Table 2.1.3**.

	Including Petro	leum and Gas	Excluding Petroleum and Gas				
	Exports	Imports	Exports	Imports			
1980	23,950.4	10,834.4	6,168.8	9,090.4			
1981	25,164.5	13,272.1	4,501.3	11,550.8			
1982	22,328.3	16,858.9	3,929.0	13,314.1			
1983	21,145.9	16,351.8	5,005.2	12,207.0			
1984	21,887.8	13,882.1	5,869.7	11,185.3			
1985	18,586.7	10,259.1	5,868.9	8,983.5			
1986	14,805.0	10,718.4	6,528.4	9,632.0			
1987	17,135.6	12,370.3	8,579.6	11,302.4			
1988	19,218.5	13,248.5	11,536.9	12,339.5			
1989	22,158.9	16,359.6	13,480.1	15,164.4			
1990	25,675.3	21,837.0	14,604.2	19,916.6			
1991	29,142.4	25,868.8	18,247.5	23,558.5			
1992	33,967.0	27,279.6	23,296.1	25,164.6			
1993	36,823.0	28,327.8	27,077.2	26,157.2			
1994	40,053.4	31,983.5	30,359.8	29,616.1			
1995	45,418.0	40,628.7	34,953.6	37,717.9			
1996	49,814.8	42,928.5	38,093.0	39,333.0			
1997	53,443.6	41,679.8	41,821.1	37,755.7			
1998	48,847.6	27,336.9	40,975.5	24,683.2			
1999	48,665.4	24,003.3	38,873.2	20,322.2			

 Table 2.1.3. Trend Value of Exports and Imports

 Unit: Million Rupiah

Sour c e: 1) Statistical Year Book of Indonesia, 1999, BPS

(4) Finance

Considering public finance, the high fluctuation in the currency exchange rate during 1998-1999 had a negative impact on the government budget.

A worsening performance of Indonesian economy followed by the political instability led to the increased government expenditure exceeding government revenue. Actual government revenue and expenditure are shown in **Table 2.1.4**. Government revenue consists of routine revenue, which contains oil and gas revenue, non-oil and gas revenue, taxes and duties, and development revenue, which contains program aid and projects aid.

Meanwhile government expenditure consists of routine expenditure, which contains personnel expenditure (rice allowance, salaries and pensions, food allowance, etc.), material expenditure (domestic material expenditure and overseas material expenditure), subsidies to autonomous region, interest and debt repayment, etc. and Development Expenditure, which contains department institutions, subsidies, distribution for regional development and projects aid, etc.

During the fiscal year 1998/1999, routine budget was recorded as much as 152,810 billion Rupiah in which 41,254 billion Rupiah of the revenue came from crude oil and gas, and the remaining came from non-oil and gas revenue. The main source of non-oil and gas was from tax, contributing around 49,714 billion Rupiah (around 32.53 %) of total routine revenue. In the same fiscal year, routine expenditure reached 147,717 billion Rupiah, which was mostly spent for interest and principal repayment of foreign debt as much as 55,798 billion Rupiah, which account for 37.8 % of the total expenditure.

Table 2.1.4. Actual Governm	nt Revenue and Expenditure
-----------------------------	----------------------------

Chit. Dimonteplat									
Actual Government Revenues									
	<u>1995 / 1996</u> <u>1996 / 1997</u> <u>1997 / 1998</u> <u>1998 / 1999</u>								
Routine revenue	73,014	87,630	108,184	152,810					
Development revenue	9,009	11,910	23,817	62,320					
TTL	82,023	99,530	132,001	215,130					
Actu	ual Governme	nt Expenditui	res						
Routine expenditures	-	62,561	84,606	147,717					
Development expenditures	-	35,952	47,200	67,869					
TTL	_	98,513	131,806	215,586					

Unit: Billion Rupiah

Source: Statistical Year Book of Indonesia, 1999

2.1.2. Social Indices

(1) Population

Indonesian population has some problems, such as big population and their unequal distribution. The number of population in 2000 is projected at around 210.5 million and around 60 % of the whole population is concentrated in Java, although the percentage of total area in Indonesia is only 7%.

Efforts to reduce population growth rate have been made by implementing family planning program since early 1970s. Projected population based on 1995 Intercensal Population Survey is shown in **Table 2.1.5**. Population grew by 1.5 % in average per year during 1996-2000 period.

				Unit: Thous	and Persons
Province	1996	1997	1998	1999	2000
Dista Aceh	3,934.0	4,004.6	4,074.9	4,144.5	4,213.4
Sumatera Utara	11,348.3	11,551.6	11,754.1	11,955.4	12,155.7
Sumatera Barat	4,400.8	4,466.4	4,531.1	4,594.8	4,657.3
Riau	4,014.2	4,106.0	4,198.2	4,290.6	4,383.4
Jambi	2,433.9	2,485.5	2,537.5	2,589.8	2,642.4
Sumatera Selatan	7,362.6	7,486.3	7,610.2	7,734.2	7,858.5
Bengkulu	1,451.2	1,485.8	1,521.1	1,557.0	1,593.8
Lampung	6,781.5	6,882.2	6,981.9	7,080.8	7,178.7
Sumatera TTL	41,726.5	42,468.4	43,209.0	43,947.1	44,683.2
DKI Jakarta	9,258.7	9,373.9	9,489.4	9,604.9	9,720.4
Jawa Barat	40,082.2	40,828.4	41,578.3	42,332.2	43,089.3
Jawa Tengah	30,026.9	30,364.3	30,703.3	31,043.7	31,386.0
DI Yogyakarta	2,950.5	2,984.3	3,018.2	3,052.1	3,086.1
Jawa Timur	34,206.9	34,524.6	34,842.1	35,160.1	35,478.0
Jawa TTL	116,525.2	118,075.5	119,631.3	121,193.0	122,759.8
Bali	2,937.7	2,975.9	3,014.2	3,052.7	3,091.2
Nusa Tenggara Barat	3,720.0	3,786.0	3,853.1	3,921.3	3,990.8
Nusa Tenggara Timur	3,653.5	3,719.0	3,784.5	3,850.1	3,915.7
Timor Timur	862.3	881.6	900.9	920.1	939.3
Nusa Tenggara TTL	11,173.5	11,362.5	11,552.7	11,744.2	11,937.0

Table 2.1.5. Populations

Unit: Thousand Persons

Source: 1) Statistical Year Book of Indonesia, 1999

2) Indonesia, In Figures, 2000

Continuation

Province	1996	1997	1998	1999	2000
Karimantan Barat	3,724.1	3,797.7	3,870.7	3,943.2	4,015.1
Karimantan Tengah	1,669.2	1,702.9	1,736.8	1,771.0	1,805.4
Karimantan Selatan	2,953.1	3,002.7	3,052.5	3,102.5	3,152.7
Karimantan Timur	2,391.6	2,453.5	2,516.1	2,579.4	2,643.1
Karimantan TTL	10,738.0	10,956.8	11,176.1	11,396.1	11,616.3
Sulawesi Utara	2,692.4	2,729.8	2,767.2	2,804.4	2,841.5
Sulawesi Tengah	1,991.1	2,036.4	2,082.5	2,129.0	2,176.2
Sulawesi Selatan	7,705.8	7,833.5	7,961.7	8,090.1	8,218.6
Sulawesi Tenggara	1,633.4	1,671.0	1,708.2	1,744.9	1,781.1
Sulawesi TTL	14,022.7	14,270.7	14,519.6	14,768.4	15,017.4
Maluku	2,128.2	2,160.8	2,192.3	2,223.0	2,252.4
Irian Jaya	2,005.9	2,058.4	2,111.5	2,165.3	2,219.5
Maluku dan Irian Jaya TTL	4,134.1	4,219.2	4,303.8	4,388.3	4,471.9
Indonesia TTL	198,320.0	201,353.1	204,392.5	207,437.1	210,485.6

Source: 1) Statistical Year Book of Indonesia, 1999

2) Indonesia, In Figures, 2000

2.1.3. Administrative Structure of National Government and Local Governments

(1) National Government

GOI is based on the Constitution that was established in 1945. The Indonesian Constitution of 1945 instituted the Presidential system of Government in the Republic.

The President is the head of State, head of the Government, and the Commander in Chief of the Armed Forces. The legislature is called the People's Consultative Assembly (PCA). The President is elected to a five-year term by PCA.

The House of Representatives is the nation's parliament.

Administrative structure of National Government (Megawati's Cabinet) is shown in **Figure 2.1.1**.



Figure 2.1.1. Administrative Structure of National Government (Megawati's Cabinet)

(2) Local Governments

The structure and organization of local governments follow the pattern of the national government. The Governor is the Chief Executive in the province and work with the staff of regional officials. The regional government concurs with regional legislation and decisions on the budget.

On the District (Kabupaten) and Municipal (Kotamadya) levels, the Chief Executives are respectively, the Bupati (District head) and Walikota Kodaya (Mayer). The Bupati/Walikota Kodaya concurs with the local legislative on matters relating to the local government regulations and budget.

Both provincial and district municipal governments are granted autonomy. Below the district municipal level, the administrative units are not autonomous. These are the Kecamatan, or Sub-District Administrations and the Kelurahan, or the Village Administrations.

The Kecamatan is an administrative sub-division of the Kabupaten or Kotamadya. It is headed by a Camat. The Kecamatan office is in charge of the administration of the sub-district, social welfare and economic affairs. Some national government departments have branches in the Kecamatan office.

The system of village administration is not much different from that of the Kecamatan. The Lurah, who heads the kelurahan, is assisted by a secretary and section heads. Unlike the Kecamatan, however, national government departments do not have branch offices in a Kelurahan.

Both the Camat and the Lurah are civil servants appointed on merit from the ranks of local government officials.

In the Desa, or village, the administrative system is somewhat different. In the office of the village head, there is a secretary and several section heads.

A unique feature of village life is the Village Council of Elders, which is composed of 9 to 15 prominent village leaders. The Council makes decisions in concurrence with the village head. In fact, this grass-roots level administration of the village, with its indigenous system of democracy and mutual help, was the inspiration of the founding fathers of the Republic when they decided on the government as laid down in Pancasila and the 1945 Constitution.

The "Lembaga Ketahanan Masyarakat Desa" is a village organization whose task is to promote socio-economic conditions so that the village becomes a viable rural community. The organization is headed by the Village Head or Lurah who is assisted by a secretary. Other members of the organization are drawn from the village community.

2.1.4. District Structure

There are 30 provinces, 261 districts, 70 cities, which are shown in **Table 2.1.6**.

	Province	District	City
1	Daerah	Aceh Selatan, Aceh Tenggara, Aceh Timur,	Sabang, Banda Aceh
	Istimewa	Aceh Tengah, Aceh Barat, Pidie, Aceh Besar,	
	Aceh	Aceh Utara, Bireuen, Simeulue	
2	Sumatera	Nias, Tapanuli Selatan, Tapanuli Tengah,	Sibolga,
	Utara	Tapanuli Utara, Labuhanbatu, Asahan,	Tanjungbalai,
		Simalungun, Dairi, Karo, Deliserdang,	Pematangsianter,
		Langkat	Tebingtinggi,Medan,
			Binjai,
			Rantauprapat,
3	Sumatera	Pesisir Selatan, Solok, Sawahlunto, Tanah	Padang, Solok,
	Barat	Datar, Padang Paliaman, Agam, Limapuluh	Sawhlunto
		Koto, Pasaman, Mentawai	Padangpanjang,
			Bukittinggi,
			Payakumbuh
4	Riau	Indragiri Ulu, Indragiri Hilir, Kepulauan Riau,	Pekanbaru, Batam
		Kampar, Bengkalis, Rokan Hilir, Siak, Kuanan	
		Sengingi, Karimun, Natuna, Pelalawan, Rokan	
		Hulu	
5	Jambi	Kerinci, Bungo, Sarolangun, Batanghari,	Jambi
		Tanjungjabung Barat, Muaro Jambi,	
		Tanjungjabung Timur, Tebo, Merangin	
6	Sumatera	Ogan Komering Ulu, Ogan Komering llir,	Palembang
	Selatan	Muaraenim(Liot), Lahat, Musi Rawas, Musi	
		Banyuasin	
7	Bengkulu	Bengkulu Selatan, Rejang Lebong, Bengkulu	Bengkulu
		Utara	
8	Lampung	Lanpung Selatan, Lanpung Tengah, Lanpung	Bandar Lampang
		Utara, Lanpung Barat, Tulangbawang,	
		Tanggamus	
9	DKI.		JakartaSelatan,Jak
	Jakarta		arta, Timur, Jakarta
			Pusat, Jakarta
			Barat, Jakarta
			Utara

Table 2.1.6. District Structure

	Province	District	City	
10	Jawa Barat	Bogor, Sukabumi, Cianjur, Bandung, Garut,	Bogor, Sukabumi,	
		Tasikmalaya, Ciamis, Kuningan, Cirebon,	Bandung, Cirebon,	
		Majalengka, Sumedang, Indramayu, Subang,	Tangerrang, Bekasi,	
		Purwakata, Karawang, Bekasi	Depok	
11	Jawa	Cilacap, Banyumas, Purbalingga,	Magelang,	
	Tengah	Banjarnegara, Kebumen, Purworejo,	Surakarta, Salatiga,	
	0	Wonosobo, Magelang, Boyolani, Klaten,	Semalang,	
		Sukoharjo, Wonogiri, Karanganyar, Sragen,	Pekalongan, Tegal	
		Grobogan, Blora, Rembang, Pati, Kudus,		
		Jepara, Demak, Semarang, Temanggung,		
		Kendal, Batang, Pekalongan, Pemalang, Tegal,		
		Brebes		
12	Daerah	Kulon Progo, Bantul, Gunaung Kidul, Sleman	Yogyakarta	
	Istimewa			
	Yogyakarta			
13	Jawa Timur	Pacitan, Ponorogo, trenggalek, Tulungagung,	Kediri, Blitar,	
		Blitar, Kediri, Malang, Lumajang, Jember,	Malang,	
		Banyuwangi, Bondowoso, Situbondo,	Probolinggo,	
		Probolinggo, Pasuruan, Sidoarjo, Mojokerto,	Pasuruan,	
		Jombang, Nganjuk, Madiun, Magetan, Ngawi,	Mojokerto, Madiun,	
		Bojonegoro, Tuban,Lamongan, Gresik,	Surabaya	
		Bangkalan, Sampang, Pamekasan, Sumenep		
14	Kalimantan	Sambas, Pontianak, Sanggau, Ketapang,	Pontianak	
	Barat	Sintang, Kapuas Hulu, Landak		
15	Kalimantan	Kotawaringin Barat, Kotawaringin Timur,	Palangkaraya	
	Tengah	Kapuas, Barito Selatan, Barito Utara		
16	Kalimantan	Tanah Laut, Kotabaru, Banjar, Barito Kuala,	Banjarmasin	
	Seletan	Tapin, Hulu Sungai, Selatan, Hulu Sungai		
	77 11	Tengah, Hulu Sungai Utara, Tabalong	D 141	
17	Kalimantan	Pasir, Kutai, Berau, Bulongan, Malinau,	Balikpapan,	
	Timur	Nunukan,Kutai Barat, Kutai Timur	Samarinda,	
			Tarakan, Bontang	
1				
	Province	District	City	
----	------------	---	--------------------	
18	Sulawesi	Bolangmongondow, Minahasa, Sangihe	Manado, Bitung	
	Utara	Talaudo		
19	Sulawesi	Banggai, Poso, Donggala, Toli-toli, Banggai	Palu	
	Tengah	Kepulauan, Buol, Morowali		
20	Sulawesi	Selayar, Bulukumba, Bantaeng, Jeneponto,	Makkasar, Parepare	
	Seletan	Takalar, Gowa, Sinjai, Maros, Pamgkajene		
		Kepulauan, Barru, Bone, Soppeng, Wajo,		
		Sidenreng Rappang, Pinrang, Enrekang, Luwu,		
		Tana Toraja, Polewali Mamasa, Majene,		
		Mamuju, Luwa Utara		
21	Sulawesi	Buton, Muna, Kendari, Kolaka	Kendari	
	Tenggara			
22	Bali	Jembrana, Tabanan, Bandung, Gianyar,	Dempasar	
		Klukung, Bangli, Karangasem, Buleleng		
23	Nusa	Lombok Barat, Lombok Tengah, Lombok	Mataram	
	Tenggara	Timur, Sumbawa, Dompu, Bima		
	Barat			
24	Nusa	Sumba Barat, Sumba Timur, Kupang, Timor	Kupang	
	Tenggara	Tengah Selatan, Timor Tengah Utara, Belu,		
	Timur	Alor, Flores Timur, Sikka, Ende, Ngada,		
		Manggarai		
25	Maluku	Maluku Tengah, Buru, Maluku Tenggara,	Ambon	
		Maluku Tenggara Barat		
26	Maluku	Maluku Utara, Halmahera	Ternate	
	Utara			
27	Irian Jaya	Sorong, Manokwari, Fakfak, Mimika,	Sorong, Jayapura	
		Yapen-Waropen, Biak-Numfor, Nabire, Puncak		
		Jaya, Paniai, Jayawijaya, Merauke, Jayapura		
28	Banten	Pandeglang, Lebak, Tangerang, Serang	Tangerang, Cilegon	
29	Bangka-	Bangka, Belitung	Pangkalpinag	
	Belitung			
30	Gorontalo	Gorontalo, Buolemo	Gorontalo	

2.1.5. Distribution of Industry and Economics (district-wise) GDP is defined as the total final products of all production units in Indonesian industry. Gross Regional Domestic Product (GRDP) 1999 by province at 1993 Constant Prices are shown in **Table 2.1.7**. Considering the said table, the followings are clarified:

- (1) Distribution of principal industries is Manufacturing (23.8%), Trade, Restaurant & Hotel (18.5%) and Agriculture (17.4%).
- (2) Major production provinces in Manufacturing are West Java (23.1%), East Java (16.1%), DKI Jakarta (13.4%) and Central Java (13.3%).
- (3) Major production provinces in Trade, Restaurant & Hotel are DKI Jakarta (19.0%), West Java (17.0%) and East Java (16.7%).
- (4) Major production provinces in Agriculture are East Java (15.1%), West Java (13.8%), Central Java (12.4%) and North Sumatra (11.0%).
- (5) In Finance, Rent of Bldgs & Services are concentrated in DKI Jakarta (47.4%).

		Industry									
No	Province	Agriculture	Mining & Quarrying	Manufacture	Elect.,Gas & Water Supply	Construction	Trade,Rest & Hotel	Transport & Communicatio	Finance,Rent of Bdlg &	Services	Total
1	Dista Aceh	2,488,479	2,071,989	2,761,953	30,299	401,715	672,397	878,413	(30,251)	638,396	9,913,390
2	North Sumatera	7,278,128	297,372	5,028,059	356,733	964,611	3,960,809	1,883,975	1,451,758	1,676,979	22,898,425
3	West Sumatera	1,619,866	447,384	1,207,579	166,325	288,574	1,260,486	953,923	381,813	1,255,013	7,580,962
4	Riau	1,664,725	10,675,294	3,841,960	97,809	490,252	1,636,823	639,896	621,049	643,598	20,311,406
5	Jambi	880,435	256,986	566,804	30,294	96,407	556,965	334,364	131,548	327,510	3,181,314
6	South Sumatera	2,840,526	2,442,977	2,701,062	121,139	767,262	2,568,058	675,349	563,356	979,582	13.659.311
7	Bengkulu	508,754	53,212	78,117	17.086	47.688	278.051	274.184	94,230	306.314	1.657.636
8	Lampung	2,589,758	95.011	958,793	62,761	484,575	1,127,490	549,328	380,392	629,717	6.877.825
9	DKI Jakarta	117,295	-	12,178,650	1,186.004	6,202,266	13,350,800	5,652,106	12.671.550	5,279,522	56.638.192
10	West Java	9.098.516	2,142,073	20,994,798	2.046.565	2,210,240	11.968.042	3,555,871	2,239,850	5,780,293	60.036,248
11	Central Java	8,163,293	575,613	12,036,862	450,221	1,626,238	9.016.169	1,946,927	1,559,305	3,987,777	39,362,405
12	DI Jogyakarta	731,746	60,251	681,611	35,438	383,269	767,870	632,772	552,572	999,434	4,844,963
13	East Java	10,004,104	483,150	14,600,121	1,332,448	2,858,151	11,780,918	4,443,029	3,107,423	5,660,669	54,270,012
14	West Kalimantan	1,709,628	104,318	1,335,967	60,905	436,576	1,369,996	739,834	497,864	810,970	7,066,058
15	Central Kalimantan	1,524,622	87,535	367,977	16,336	198,378	753,094	501,325	93,048	444,396	3,986,710
16	South Kalimantan	1,326,859	990,569	1,122,427	85,181	264,884	826,344	656,228	183,521	522,313	5,978,327
17	East Kalimantan	1,702,427	6,738,547	7,021,855	75,642	567,193	1,906,007	2,257,788	590,978	522,923	21,383,360
18	North Sulawesi	1,066,389	279,076	371,167	31,225	367,373	488,401	561,935	98,460	623,085	3,887,112
19	Central Sulawesi	964,507	63,167	178,295	18,908	156,550	259,376	202,830	92,883	350,864	2,287,380
20	South Sulawesi	3,516,068	418,866	1,214,726	135,134	449,215	1,617,782	746,082	429,860	1,103,342	9,631,076
21	South East Sulawesi	528,779	47,430	128,615	16,248	130,183	212,197	168,184	75,398	281,424	1,588,457
22	Bali	1,423,941	54,704	614,832	99,235	326,361	2,310,388	907,690	479,402	1,082,848	7,299,401
23	Nusa Tenggara Barat	1,196,546	126,783	157,314	17,866	241,295	534,930	400,876	80,347	562,767	3,318,723
24	Nusa Tenggara Timur	1,084,321	36,839	68,209	30,645	190,678	402,340	304,295	122,708	594,473	2,834,510
25	Maluku	687,804	66,020	254,754	18,325	16,778	429,668	179,802	140,469	328,262	2,121,882
26	Irian Jaya	1,333,075	5,059,911	267,099	23,869	305,915	334,718	284,963	106,818	431,882	8,148,250
	Total	66,050,591	33,675,077	90,739,606	6,562,641	20,472,627	70,390,119	30,331,969	26,716,351	35,824,353	380,763,335

Table 2.1.7. GRDP 1999 by Province at 1993 Constant Prices

Source; Badan Pusat Statistic by BPS, Very Preliminary Figure, Unit: Million Rupiah

2.1.6. National and Domestic Socio-economic Development Plan For recovering from the economic crisis, GOI consulted and agreed with IMF on Letter of Intent (LOI). Memorandum of Economic and Financial Policy (MEFP) which was attached to LOI was agreed between IMF and GOI regarding macroeconomic policy, financial regional autonomy, banking system reform, enterprise restructuring, legal reform, governance, restructure in public sector, etc.

The latest macro-economic policy has been managed by the economic reform program stipulated in LOI dated Jan. 20th 2000 as a middle term macro economic frame. It has been reviewed and adjusted slightly on May 17th 2000, July 31st 2000 and September 7th 2000. The State Policy Guide Line (GBHN) had been decided based on LOI in October 1999 and National Development Program (PROPENAS), which was established by GBHN, is a new development plan replacing by "National Five Year Development Plan" (REPELITA) through 2000 to 2004.

The macro-economic framework provides a description on the short and middle term economic prospect. According to GBHN 1999-2004, the directions of macro-economic policy are:

- (1) To accelerate economic rescue and recovery so as to enable the real sector to be recovered;
- (2) To attain a reasonable level of interest rates, inflation under control, and attain a suitable and realistic exchange rate;
- (3) To restructure the State Budget, by reducing budget deficits, gradually reducing subsidies and foreign loans and make the tax structure progressive and equitable, and economize expenditures;
- (4) To accelerate banking recapitalization and restructure corporate debt;
- (5) To reduce poverty and unemployment;
- (6) To support the development of the people oriented/grass root economy.

Therefore, in the short term, macro-economic policy directed at economic recovery. In line with the implementation of other policies, medium macro-economic policies aiming at strengthening the base for sustainable and equitable development.

Regarding regional development, the policy directions as stipulated in the GBHN 1999-2004, the aim of regional development in the period, are:

(1)To ascertain the realization of regional autonomy by increasing the capability of regional governments;

- (2) To increase regional potential by developing the regional economy;
- (3)To increase the people's empowerment by strengthening the local community institutions and organizations, alleviating poverty and providing social protection to the local communities and increasing self-reliance of the public at large for assisting the communities to obtain and utilize their rights for improving the economic, social and political life;
- (4) To accelerate special handling of the Aceh special region, Irian Jaya, and Maluku in conformity with the aspirations, capabilities and cultural roots of the local communities and in line with the principle of national unity and cohesion through the restoration and development of the socio-economic life of the communities, through the settlement of the political problems and violations of human rights and by strengthening the capacity of regional governments.
- The crosscutting issues in the effort for increasing regional development are enhancing and strengthening regional autonomy.
- 2.1.7. Land Transportation Industry and Sea-borne Industry The economic and financial crisis has caused dramatic declines in transportation sector, especially road transport, but railway transport is found only in Java and Sumatra. It increased steadily comparing to road transport. Sea transport decreased temporarily in 1998, since then it has increased steadily. The changes of Index of GDP are shown in **Table 2.1.8**. The automobile industry were greatly shocked by the crisis, which is shown in **Table 2.1.9**.

				. ,
	1996	1997	1998	1999
Railway Transport	160.80	169.65	182.47	206.26
Road Transport	117.61	125.93	93.94	85.36
Sea Transport	127.87	124.58	120.64	132.33
Inland Water Transport	118.90	120.50	110.09	109.33

 Table 2.1.8. Index of GDP at Const. 1993 Market Prices (1993=100)

Source: Pendapatan National Indonesia

	1994	1995	1996	1997	1998	1999
Jeeps	5,922	6,079	5,598	4,081	1,257	1,287
Passenger cars	41,807	39,839	35,303	55,102	8,401	5,974
Pick Up	226,114	275,552	220,681	267,367	43,194	69,454
Buses	34,994	48,020	52,761	49,958	4,699	10,435
Trucks	16,184	18,051	11,151	12,771	528	1,812
Motorcycles	781,404	1,042,938	1,425,373	1,861,111	519,404	571,953
Total	1,106,425	1,430,479	1,750,867	2,250,390	577,483	650,632

 Table 2.1.9. Number of domestically assembled Vehicles (1994-1999)

 Unit: Unit: Units

Source: Statistical Year Book of Indonesia, 1999

2.1.8. Development Policy regarding Land and Shipping Transportation (1) Development Plan by PROPENAS

PROPENAS is a new development plan that gives the development policy for land and shipping transportation facilities and infrastructure, in which the following aims are described:

To improve transportation services so as to become efficient, reliable, having high quality, safe and affordable priced;

To realize an inter-mode national transportation system that is integrated to the development of the relevant area;

Becoming part of a distribution system that can provide services and benefits to the public at large;

Having the ability to increase adequate urban-rural network.

The objectives for the development of land and shipping transportation facilities and infrastructure are as follows:

To maintain and to increase transportation facility and infrastructure; To continue the restructuring and reforming of transportation;

To increase the accessibility of society to transportation facilities & infrastructure services.

The main activities to attain the above policy are as follows;

To rehabilitate and maintain transportation facilities and infrastructure, especially the rehabilitation of roads, railway infrastructure, ferry infrastructure, wharfs and airports.

To increase efficiency through the management system so as to optimize the existing transportation facilities and infrastructure. To increase the serving capacity of transportation at transportation serving routes that have exceed their capacity, namely where bottlenecks have become evident.

To increase the serving system by improving the data and information system, the technical standards system for transportation infrastructure and facilities.

(2) Development Plan by Strategic Plan of Sea Transportation Development, DGSC

The realization of sea transportation objectives manifested with the establishment of policy and strategy of sea transportation are as follows:

Preservation capacity and quality of service of facility and infrastructure of provided sea transportation.

Affordable service of facility and infrastructure of sea transportation all over the country.

Implementation of sea transportation service in mechanism of Regional Autonomy support.

Gradual accomplishment to be good governance in managing sea transportation services in which the orientation is focused to the balance of the rights and obligations of users and providers of sea transportation services.

Accomplishment of transportation service implementation including pioneering service all over Indonesia.

Improve productivity and performance of facility and infrastructure on sea transportation including assets that belongs to BUMN in Department of Communication environment.

Manifestation of fair competition atmosphere in providing sea transportation facility and infrastructure.

Implementation of restructuring funding system of facility and infrastructure of sea transportation.

The establishment of research and development results shall be directly applied to the improvement of technology transfer.

Embodiment of human resources, which are honest, qualified, professional, and responsible as well as competitive.

Improving safety and security of sea transportation service.

Implementation of consistent law enforcement and proceeding with effort to remove corruption, collusion and nepotism,

Manifestation of international in sea transportation with mutual benefit and may draw investment that are likely to render value added incentives. Provisions of support for smooth sea transportation for mobility of election (ballots box, voting cards and other supplies) to all sites of election (Domestic or Abroad)

2.1.9. Commercial Energy Supply

Electricity is mainly supplied by Perusahaan Listrik Negara (PLN) and the rest is supplied by Independent Power Producer (IPP), cooperatives and local governments. The capacity of electric power generation of PLN is 60 % of that of whole Indonesia. Non-PLN companies usually operate under a capacity of less than 1 KWH with more than 10 household as its client. PLN produces electricity which comes from 11 regions, 4 distribution areas and several producing centers in Java-Bali and Sumatra.

The demands for electricity had been increased between late 1960s and early 1990s, so that construction of electric infrastructure had been urgently needed. Since then, the demand for electricity had been decreased temporarily by the influence of the economic and financial crisis. But, by the economic recovery, the demands for electricity have been increased and maximum demand was recorded in Oct. 2000.

The features of electricity supply in Indonesia are the followings:

(1) Own power plants (by users)

The generation of electricity by own power plants by user account for 40 % of the whole Indonesian capacity.

The reasons are as follows:

Indonesia consists of over 13,000 islands, so that deployment of power transmission network is not effective.

GOI gave high priority to Java-Bali area to secure stabilization of electric power supply in that area, therefore own power plants by users were approved by GOI.

But recently own power plants are returning to stand as emergency electric source because of the stabilization of electric power supply in Java-Baliarea.

(2) Shortage of electric power

Indonesian economy had been stagnant due to the economic crisis. Recently it has been recovering. At the same time, the demands for electricity have been increased, for instance, 9.9 % increase in 2000. The demands for electricity are forecasted an increase of 8.9 % between 2000 and 2010 by the

government plan (RUKN).

The government plans to construct new electric infrastructures and build up existing facilities for that purpose. However the peak loads (max. electric load/capacity of electric power generation) in Java-Bali area have been forecasted 16% in 2003, 22% in 2004 and 2005. These are below 25%, which is the necessary minimum rate. Furthermore, construction of new electric infrastructures is not taking shape now and construction of huge electric infrastructures will take 4 to 8 years. Therefore Shortage of electric power will appear in 2004.

2.2. Natural Conditions

The following statistical data of the natural conditions are obtained mostly from the British Admiralty Sailing Directions.

2.2.1. Climatic Conditions

Because of Indonesia's geographical location, the climate is influenced by the Indian Ocean, the Pacific Ocean and the Continents of Asia and Australia.

Indonesia has two types of monsoon seasons, one is the southeast monsoon which blows from Australia during May to September and the other is the northwest monsoon which blows from the continent of Asia during November to March. The climate of Indonesia is greatly influenced by these monsoons.

Appendix 2.2.1. through **Appendix 2.2.11**. show monthly climatic data complied from 10 to 30 year observations, 1945 to 1994 showing the following components from (1) to (10) in Jakarta, Surabaya, Palembang, Medan, Balikpapan, Banjarmasin, Ujungpandang, Manado, Kupang, Sorong and Merauke.

- (1) Average pressure at MSL
- (2) Temperatures
- (3) Average humidity
- (4) Average cloud cover
- (5) Precipitation
- (6) Wind distribution
- (7) Mean wind speed
- (8) Number of days with gale
- (9) Number of days with fog
- (10)Number of days with thunder

2.2.2. Geographical and Topographical Conditions

(1) Seabed

Southeast part of Malacca Strait

The southeast half of Malacca Strait is generally less than 50m in depth. Strong currents occur on the bottom of the narrowest part, causing large uniform sand waves to form at right angles to the current flow.

Northwest part of Malacca Strait

In the northwest approach to Malacca Strait, the depths increase generally to the depth of 100m contours, and sand predominates before the continental slope to the Andaman Sea.

Beyond the shelf edge, the bottom is mainly mud with isolated patch of sand.

At the west of Dreadnought Bank, the bottom falls away steeply, reaching depths over 3800m in the channel between Sumatra and Great Nicobar Island.

Southwest coast of Sumatra

The southwest coast of Sumatra and outlying islands have shallow coral fringes, beyond which depths increase rapidly. Between these islands and Sumatra, there are 3 elongated basins with depth from 500 to 1000m.

Sunda Shelf

Sunda Shelf is one of the largest shallow sea areas in the world. At the west end of Selat Sunda, the edge of the shelf falls steeply towards the floor of the Indian Ocean.

North coast of Java

North coast of Java is most severely affected by deposits of alluvial sediments causing coastline extensions seawards.

South of Java and Nusatenggara

The zone of the fold mountains is bounded on the Indian Ocean side by a narrow zone comprising a double line of trenches running close and parallel with Java and Nusatenggara. The inner depression is known as the Lombok Basin, and the outer and deeper is known as the Sunda Trench (Java Trench), which contains the greatest known depth in the Indian Ocean, 7244m.

Java Sea

The typical depths in the Java Sea range from about 40m or less in the west part, and 30 to 75m in the east part, gradually taking a very gentle downward sloping seabed to the south limit of Selat Makasar where it drops nearly 550m and to even greater depths toward Selat Lombok in the south.

Bottom conditions of the Java Sea, and in the shallow water of Selat Makassar fronting the east coast of Kalimantan, are dominated by the processes of the shallow water disposition of river borne sediments, and of coral growth in those parts relatively remote from sources of sediment. Southwest of Kalimantan

There are elongated sandbanks aligned with the direction of the tidal streams, with muddy channels between them.

Banda Sea

The Banda Sea is enclosed on its south side by a chain of active and extinct volcanoes forming the Inner Banda Arc. A series of deeps, culminating in the Weber Basin, 7439m deep, lies external and parallel to the volcanic chain.

A non-volcanic arc, known as the Outer Banda Arc, extends from Buru to Timor, as an enormous U-shaped chain.

(2) Sand waves

Malacca Strait

On the bottom of the narrow part of the southeast half of Malacca Strait, strong current causes large sand waves to form at right angles to the current flow.

Their height is between 4 and 7m, and the lengths of their waves are between 250 and 450m. In addition, there are large long ridge running parallel with the direction of the tidal currents.

Other areas

In the other areas, sand waves are particularly in evidence off the coastal bank of the south coast of Kalimantan, in Selat Kalimata, in the area leading from Java Sea into Selat Makassar, and in the shallower waters north of Pulau-pulau Kankean.

2.2.3. Current, Sea Level, Tide, Tidal Streams, Sea and Swell (1) Current

The currents in the Indonesian waters are also subject to variations linked to the reversal of the monsoons.

Change is continuous with the advance, retreat and intensity of each monsoon varying from year to year.

Appendix 2.2.12. through **Appendix 2.2.19.** show the predominant currents in the following areas during the different seasons of the year:

Sumatra Java Sulawesi, Nusatenggara Irian Jaya

(2) Sea level, tide and tidal streams

Followings are characteristics of the tides at each area. Further details are given in Admiralty Tide Tables.

Sea level

Marked seasonal changes in weather, such as those which occur during monsoons, result in changes of sea level due to the effect of wind and/or barometric pressure.

Tide

a. Malacca Strait

In Malacca strait, the tide is generally semi-diurnal with the diurnal component increasing towards the southeast end.

In Singapore Strait, the diurnal component starts to increase rapidly becoming a diurnal tide at about Tanjung Ayam on the north coast and Pulau Kapalajernih on the south coast.

The high water wave travels through Malacca Straight from northwest to southeast into Phillip Channel where it meets the diurnal wave from the South China Sea that has passed west through Singapore Strait.

The tidal range increases to a maximum of 3.7m at One Fathom Bank, then decreases to 1.9m at Gesong Rob Roy Bank, increases again to 2.6m at the level of Pulau Pisang and finally decreases again in Singapore Strait to 1.6m at Horsburgh Lighthouse.

b. Southweat coast of Sumatra

At Pulau Raya, the range is only 0.2m, to the southeast, the range increases, the range is 0.8m on the equator.

c. Selat Sunda

The tides in Selat Sunda and round the islands on the south side of Singapore Strait are semi-diurnal, the mean spring range in the former being not more than 1.0m, and in the latter about 1.5m at the east end, increasing to 3.0m at the west end.

d. North coast of Java

On the north coast of Java and in Selat Surabaya are predominantly diurnal, the main straits separating Java with Bali and Bali with the islands of Nusatenggara are all predominantly semi-diurnal, farther east there is a mixture in places but generally the tides are semi-diurnal. The tidal range seldom exceeds 0.5m, and through Selat Surabaya 1.5m.

e. East coast of Sumatra

On the east coast of Sumatra and the coast of Pulau Banka and Pulau Bilitung, the range is mostly between 1.0 and 1.5m, but it increase to over 2m at the outer bar of Sungai Palembang and off the coast north of Kuala Niur.

f. South and west coast of Kalimantan

On the south coast of Kalimantan, the range of the tide seldom exceeds 1.0m, whilst on its east coast the range may reach 2.5m, and 1.5m in the vicinity of Teluk Sukadana.

g. Nusatenggara

Around the islands of Nusatenggara the range seldom exceeds 1.5m.

h. Sulawesi

Throughout Sulawesi the range seldom exceeds 1m.

i. Irian Jaya

The greatest tidal ranges are to be found in Selat Marianne, where it is 5.4m, and at the head of Teluk Bintuni where it is 4.4m.

In the islands fringing Celebes Sea, the range is between 1.5 and 2m, almost elsewhere it is between 1 and 1.5m.

Tidal streams

a. Malacca Strait

The flow in Malacca Strait is considerably influenced by the prevailing northwest-going current which, in the main channel, has a rate of about 3/4 knot, but may vary considerably.

In the north part of Malacca Strait, the general directions of the tidal streams are : - 0100 local HW Southeast-going at maximum rate.

- 0100 local LW Northwest-going at maximum rate.

In the main fair way, the spring rates are about 1.5 knots, but in the more restricted channels and inshore waters, they may reach 2.5 to 3 knots.

At the south end of Malacca Strait, the streams set southeast and northwest to and from Selat Durian. They are not necessarily associated with any particular streams in Singapore Strait, and many meet or separate from the latter south of Tanjung Piai, the south extremity of Malaysia.

b. Sumatra, Java and southwest Kalimantan

Tidal streams in these areas have a marked diurnal inequality which generally increase east.

One stream of the day in each direction is markedly stronger than the other, and, in many cases, there is only one stream of any strength in each direction per day.

Also the strength of the tidal streams, in general, decreases from west to east of the area, whereas rates exceeding 3 knots occur in many channels in Pulau Pulau Lingga and Pulau Pulau Riau, rates rarely attain 1 knot off Pulau Belitung and west coast of Kalimantan.

c. Java, Nusatenggara, Kalimantan and Sulawesi

Tidal streams in these areas have a strong diurnal inequality.

This is especially marked on the coast of Kalimantan and Java, bordering the Java Sea, where the tides are predominantly diurnal. The range of the tide is mostly between 1 and 2m, though at some places on the east coast of Kalimantan and on Froles it reaches 2.5m.

d. Halmahera and Irian Jaya

Within these areas, there is considerable diurnal inequality.

This is the least in the northwest, on the coasts of Halmahera and Sulawesi and the islands in Celebes Sea to the north, where despite the inequality, the tides are classified as semi-diurnal, and the greatest in the southeast where on the east coast of Pulau Pulau Aru and a stretch of the southwest coast of Irian Jaya, the tide is usually diurnal.

(2) Sea and swell

Sea

a. Malacca Strait

Sea state is almost invariably smooth or slight in Malacca Strait. Squalls may raise moderate or rough seas for short periods.

In the N approaches to Malacca Strait and off the west coast of the south part of Sumatra, rough seas may be encountered from May to September on about 5 % of occasions.

b. Sumatra, Java and southwest Kalimantan

Sea waves are generated locally by the wind and can be very variable in direction, especially in the transitional months (April and late October to November) between the northwest and southwest monsoons. Throughout the year, the height of the sea waves is frequently less than 1m. During the transitional months moderate or higher seas are reported on less than 3% of occasions. In January, moderate or higher seas are reported on around 10% to 14% of occasions in the extreme north and southeast of the area, and about 4% to 8% in central areas. During August, the figures are around 5% to 7% of occasions in the south and 3% to 5% in the north.

c. Java, Nusatenggara, Kalimantan and Sulawesi

Sea waves are generated locally by the wind and can be variable in direction during transitional months between late March and April and again between October and mid November. Off the east coast of Kalimantan, seas of around 2m or over are relatively rare with a frequency of around 2% to 3% of occasions. Over the south part of Selebes Sea and the whole of the Molucca Sea , the frequency is around 5% to 10% during the northwest monsoon and 8% to 14% during the southeast monsoon.

During the height of the northwest monsoon, the frequency of 2m waves and over, in the central part of the Java, Flores and Banda Seas, decreases from around 14% of occasions in the west to 11% in the east, and during the southeast monsoon, it is usually less than 10% of occasions.

To the south of Java and Nusantenggara, in January, the frequency is 18% in the far southeast, and increasing to around 23% in central south areas, then decreasing to around 15% in the extreme southwest of the area.

The percentage figures during the height of the southeast monsoon are 15% in the extreme southeast of the area and then steadily increasing to around 45% to 50% in the extreme southwest of the area.

In the transitional months of March/April and October/November, the frequency is generally less but around 25% to 30% in the extreme southwest.

d. Halmahera and Irian Jaya

Seas from between east and south prevail over the area from about the end of May until late August or early September when the area is dominated by the southeast monsoon. In the area north of about 5° S, the seas are from southeast to south, mostly slight to moderate but occasionally becoming rough. In the area south of 5° S, the east to southeast seas are often only slight to moderate but may be rough or very rough on up to 10% of occasions.

As the southeast monsoon weakens and recedes south to be followed by the northwest monsoon, seas from between northwest and northeast in response to this change of regime gradually extend south to most parts, reaching the south of the area by December. Wave heights are mainly moderate or slight but rough or very rough seas are not uncommon.

These seas from northwest to northeast continue through March and then the southeast monsoon spreads north again, sometimes preceded by a few weeks of less well-defined seas.

Swell

a. Malacca Strait

Swell in Malacca Strait is normally negligible or slight, and only on rare occasions a moderate swell develops, and there is no predominant direction.

Off the west coast of Sumatra, swell from between southeast and southwest is a regular feature. Swell height is normally less than 2m, but during the southwest monsoon, moderate swells from 2 to 4m develop.

b. Sumatra, Java and southwest Kalimantan

In the north of these areas in January, swells from between north and northeast are not common, although swells of 2m and over are only reported on about 5% to 8% of occasions.

In central areas, swells are most frequent from between north and northwest, and in the southeast of these areas from west-northwest. Swell heights of 2m and over are reported on around 5% to 10% of occasions in the south and southeast.

In August, swells of 2m high and over are reported on less than 2% of occasions in central and north areas, and on about 2% to 4% in the south and southeast.

The predominant direction of the swell is from east-southeast in the south of the area becoming south-southeast in the north.

c. Sumatra, Java and southwest Kalimantan

In the north of these areas, the swell is often low in January, and low in July, and in the Java, Flores and Banda Seas, low in January and July. To the south of Java and Nusatenggara in January, the swell is often low in the southwest of the area and low to moderate in the east of this area. In July, the swell in the southwest of the area is frequently moderate from between south and east, and low from east-southeast in the extreme southeast of the area.

d. Halmahera and Irian Jaya

In the rare occasions when a tropical storm affects the area, the confused and steady swell from these storms affects the area.

The north shores exposed to the Pacific also experience considerable swell from December to February, during the northwest monsoon. Heavy swell accompanied by high seas is a hazard during these months, but conditions vary markedly according to the strength of the monsoon.

The extreme conditions can occur in straits and constricted channels, when favorable winds are funneled and thereby increased in strength.

2.2.4. Earthquake and Tsunami

(1) Earthquake

Indonesia is prone to earthquakes, with epicenters distributed along the same regions as volcanoes. Although many causes contribute to the geological instability of the area, the main cause is the friction between the underlying tectonic plates.

Most of Indonesia sits on the Eurasian Plate. When the Eurasian Plate collides with the Indo-Australian Plate to the south and east or the Philippines and Caroline Plates to the northeast, the second plate slides underneath the Eurasian Plate.

The pressure causes geological activity on the earth's surface that often takes the form of earthquakes or volcano eruptions.

Recent destructive earthquakes include a 1992 tremor that struck the island of Flores, killing 2,000, and an earthquake that struck Sumatra in 1994, killing 180.

Table 2.2.1. and **Table 2.2.2.** show destructive earthquakes in Indonesia from1800 to 1998, and record of earthquakes with magnitude 5 richer and over in1998.

Region	Number of disastrous	Percentage of	Number of	Percentage of
	earthquakes	occurrences	fatalities	fatalities
Western Sunda arc	35	19.1%	716	6.7%
Eastern Sunda arc	82	44.8%	2502	24.9%
Banda arc	20	10.9%	285	2.7%
Makassar Strait	10	5.5%	2	0.0%
Molucca Sea	23	12.6%	340	3.2%
Northern Irian Jaya	13	7.1%	6,738	63.2%
Total	183	100.0%	10,663	100.0%

Table 2.2.1. Destructive Earthquakes in Indonesia from 1800 to 1998

Table 2.2.2. Earthquakes with Magnitude 5.0 Richer and Over in 1998

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<u>Dempasar 26.Oct 5.1</u> 20,Sep 5.6
Sumba Strait 12.Oct 6 26.Sep 6.5
South of Sumbawa Island 03,May 5.1 Sumbawa Island Region 21,May 5.5
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Flores Island Region 21, Apr 5 III-V MMI 28, Oct 6.5
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Table 2.2.2. Continuation

Banda Sea	14,Jan	5.3	Bitung-I-II MMI	29,Oct	5.5
	24.Jan	5.4	-IV MMI	28.Oct	6.3
	16,Feb	5.2	Luwuk V-VI MMI	29,Nov	6.5
	19,Feb	6.5	Poso IV MMI	10,Oct	6.1
	19,Feb	6.3	Arue	17,Jan	5.7
	19,Feb	5.9	Ceram	13,Jan	6.3
	21,Feb	5		14,Jan	5.7
	22,Feb	6		22,Feb	5.5
	25,Mar	5.6		23,Apr	5.2
	25,Apr	5.6		27,May	5.9
	10,May	5.8		28,May	5.4
	16,May	5.9	Ceram Sea	02,Aug	5.8
	21,May	5.7	Halmahera	17,Jan	5.2
	14,JUn	5.5		17,Jan	5.4
	17,Jun	5.6		27,Jan	5.8
	02,Jul	5		27,Jan	5.5
	31,Jul	5.3		18,Apr	5
	29,Aug	5.8		19,Apr	5.7
	31,Aug	6.1		22,Apr	5.1
North of Halmahera	24,Apr	5.4		30,Apr	6
Buru	19,Apr	5.4		01,Jul	6
Ambon II-III MMI	29,Nov	6.5		27,Jul	5.7
West Irian	06,Feb	5.8		27,Jul	5.8
	06,Feb	5.8		29,Jul	6
	24,Apr	5.3		27,Aug	5.2
	27,Apr	5.7			
	16,Jul	5.8			
Near N Coast of W Irian	27,Feb	5.1]		
	16,Jun	5.1			
	29,Jul	6.1			

Source : Statistik Indonesia 1999

(2) Tsunami

During the period of 1600-1999, 105 tsunamis have occurred in Indonesia. 90% of them were caused by earthquakes in a shallow region at subsidences and plate boundaries, 8% by volcanic eruptions, and 1% by a landslide.

Seismic activities were found high in east Sunda, Banda and Makassar and tsunami activities were found in west sunda, Banda and Molucca. An interval of about 100 years was found for high earthquakes and tsunami activities in the period 1800-1999.

The percentages of earthquakes accompanied by tsunami to all earthquakes in Banda and Molucca exceed 50%.

In terms of human loss due to tsunami, west Sunda is the worst zone because of the devastating damage done by the 1883 Karakatau volcanic eruption. The tsunami potentials in Banda since 1960 have been remarkably high. **Table 2.2.3**. shows tsunami activity in Indonesia during the period of 1600 \sim 1999.

Region	Number of	Percentsge of	Number of	Percentage of
	tsunami	occurrences	fatalities	fatalities
Western Sunda arc	16	15.30%	36,360	67.70%
Eastern Sunda arc	10	9.50%	3,261	6.00%
Banda arc	35	32.30%	5,570	10.30%
Makassar Strait	9	8.60%	1,023	1.90%
Molucca Sea	32	39.80%	7,576	13.90%
Northern Irian Jaya	3	2.90%	357	0.70%
Total	105	100%	54,147	100%

Table 2.2.3. Tsunami Activity in Indonesia during the Period of 1600 ~1999

Source : Journal of Natural Science, Vol. 22, No.1

2.3. Environmental Conditions

- 2.3.1. Laws and Regulations, etc. Related to Environmental Conservations
 - (1) Legal basis of environmental conservation

In 1997, the Act of the Management of the Living Environment (Act No.23 of 1997) was established, consequently, the Act on Basic Provisions for the Management of the Living Environment (Act No.4 of 1982) was abolished. The Act No.23 of 1997 makes the principle of environmental management clear and serves as a basic indicator for other related legislation, which consists of 10 chapters, 52 articles concerned with principle, objectives, rights, obligations, society's roles, authorities, settlements, penalty and so on.

The Act No.23 specifies the following 6 objectives in Article 4:

To achieve conformity, harmony, and balance between human-beings and the environment

To instill in Indonesian citizens the need to protect and develop the environment

To guarantee the interest of present and future generations

To achieve the conservation of the environmental functions

To control wisely the utilization of potential resources

To protect the Unitary State of the Republic of Indonesia from the impacts of a work and/or an activity outside the State's territory which causes pollution and/or environmental damages

(2) Environmentally related institutions

The Act No.23 stipulates that each plan of an activity or a work that may cause a large or important impact to the environment must have an environmental impact analysis (AMDAL).

The government regulation regarding AMDAL has been established in 1986, and which was revised in1993 in order to simplify the procedure of AMDAL and strengthen the function of the Environmental Impact Management Agency (BAPEDAL).

BAPEDAL is a government body under the direct control of the President, established in 1990, and is empowered to implement environmental conservation measures and environmental monitoring.

(3) National Development Program (PROPENAS) of 2000-2004

Table 2.3.1. shows the Policy Matrix of Natural Resources andEnvironmental Management Development Programs defined in Chapter X(Natural Resources and Environmental Management) of the PROPENAS of2000-2004.

- (4) Decree of the Minister of Communication No. KM4 and KM5 1996
 - Decree of the Minister of Communication No.KM4 1996, attached in appendix, stipulates the compulsion for completion of Environmental Management Effort (UKL) for the business plan or activity related to Sea Communication Sub-sector, and No.KM5 1996 stipulates the technical manual for implementation of UKL and UPL.

The followings are the points of each decree:

According to the spirit of these 2 decrees, we decided to implement the UKL and UPL as our environmental study.

Decree of the Minister of Communication No. KM4, 1996

- a. This decree stipulates the compulsion for completion of UKL and UPL for the business plan or activity related to Sea Communication Sub-sector, based on the Government Regulation No.51 1993 about AMDAL.
- b. This decree was stipulated in view of all concerned Laws, Government Regulations and other Decrees.
- c. UKL is the effort to support environmental-friendly development for business plan or activity, for which the implementation of AMADEL is not compulsory but the environmental management should be compulsorily completed.
- d. UPL is the effort to support environmental-friendly development for business plan or activity, for which the implementation of AMDEL is not compulsory but the environmental monitoring should be compulsorily completed.
- e. Business plan or activity related to Sea Communication Sub-sector for which UKL and UPL are compulsory shall be determined based on the type of business or activity with the criteria of size, length, width, area, volume, capacity, depth, and service level, in accordance with the impact of business and activity by the type which should be necessarily coped with.
- f. Above criteria by the type of business plan or activity related to Sea Communication Sub Sector for which UKL and UPL should be necessarily completed is shown in **Table 2.3.2**.

Decree of the Minister of Communication No. KM5, 1996

a. This decree stipulates the technical manual for the implementation of UKL and UPL related to Sea Communication Sub-sector, considering the Decree of the State Minister for Environment No.KEP12/MENLH3/1994

concerning general guide to the composition of UKL and UPL for business plan/activity to which the implementation of AMDAL is not compulsory to complete but the environmental management and monitoring effort should be compulsorily completed.

- b. This decree was stipulated in view of all concerned Laws, Government Regulations and other Decrees.
- c. The flow charts of the composition and handling of UKL and UPL are shown in **Figure 2.3.1**. and **Figure 2.3.2**.
- d. Type and description of development, description of environmental component, type of impact to be covered are shown in **Table** from **2.3.3**. to **2.3.5**.

Table 2.3.1. Policy Matrix of Natural Resources and Environmental Management Development Programs

No.	Policy Directions in the State Guideline	National Program	Performance Indicators
1.	 Managing natural resources and preserve its supporting capacity so that it can benefit efforts for enhancing social prosperity for future generations Promoting a globally oriented economy in line with technological progress by developing comparative advantage as a maritime and agricultural nation in conformity with the competitiveness of the products in each region, mainly agricultural in the broad sense, forestry, marine, mining, tourism and small scale and handicraft industries. 	1.Developing and increasing access to information on natural resources and environment	 Completing the collection of data and evaluation of the potential of natural resources and environment Availability of natural resources accounting Complied data on vulnerable ecosystem areas Availability of scientific study on information system on natural resources and environment Improved access of the general public to the information system Availability of infrastructure on spatial data related to natural resources and environment, regarding marine, land and air
2.	Increasing the utilization of natural resources and the environmental potential through conservation, rehabilitation and economic use and application of environmentally-friendly technology	2.Increasing effectiveness in management, conservation and rehabilitation on natural resources	 Availability of the plan on natural resource use Increased efficiency in the management and protection of natural resources Increased effectiveness of conservation areas functions Decreased size of critical land in forest, coastal and ex-mining areas
3.	Applying indicators to measure efforts in conserving renew-ability in the management of renewable natural resources in order to avert irreversible degradation	3.Preventing and controlling degradation and pollution of the environment	 Availability of waste processing means and clean production technology Availability of index and quality standards of national environment in the regions Increased the quality of environment Availability of reliable data to monitor the quality of the environment

Table 2.3.2. Criteria by Type of Business Plan / Activity Which should beCompleted UKL / UPL

No	Business Plan or Activity	Criteria	Remarks
Ι	Moor Facility 1. Pier/wharf 2. Depth of berth 3. Capacity of Standard Vessel 4.Trestle Moor	Length 50m~200m Depth -4mLWS~ -10mLWS Dead 1,000DWT ~ Weight Ton 2,000 DWT Width 750 m ² ~ 6,000 m ²	1. Even if harbor activities mentioned in I to II are not for loading and unloading, UKL and UPL should be implemented.
П	Terminal and Warehouse Facility 1. Passenger Terminal 2. Container Facility 3. Accumulation Field 4. Warehouse 5. Infrastructure for rain water reservoir	$\begin{array}{llllllllllllllllllllllllllllllllllll$	2.If a harbor activity has implemented AMDL, but if there is an activity which is not described in scope of harbor activity, automatically it must implement UKL & UPL.
III	Other Facility 1. Road, bridge and railway 2. Well 3. Break Water	Length 2.5Km ~ 25Km Rate of flow 2.5m ³ /hour ~ 10m ³ /hour Length 50m ~ 300m	
IV	Dredging and Reclamation 1. Dredging (Maintenance) 2. Dredging (Capital dredging) 3. Reclamation 4. Dumping	Volume 500,000m ³ ~ Volume 10,000m ³ ~ 100,000 m ³ ~ Width 2 Hectare ~ 25 Hectare Volume 50,000 m ³ ~ 500,000 m ³ ~ 500,000m ³ Volume 100,000 m ³ ~ 500,000 m ³ ~ 500,000 m ³	
V VI	Reef Flattening Work of Underwater	Volume of Coral not less than 100,000m ³ Oil /Gas Pipe with length less	
		UKL and UPL. Electric cable which has power less than 150Kv shall implement UKL and UPL. Length of telecommunication cable les than 100 Km from the nearest port shall implement UKL and UPL.	

Source: Minister of Communication

Figure 2.3.1. Rationalization Sequence of the Approach of Composition of UKL & UPL





Figure 2.3.2. Procedure for Handling of UKL & UPL

Note : For activities which had gotten government agreement, Source: Ministry of Communication please send the document to BKPM



- Information Lane
- Carbon Copy Document

	51		1 1
a.	General harbor that afforded and not afforded;	b.	Special harbor;
c.	Road, bridge and railway in port working area;	d.	Dredging / maintenance;
e.	Reclamation;	f.	Material location result of dredging;
g.	Container Terminal;	h.	Passenger Terminal;
i.	Work of Underwater;	j.	Break water
k.	Warehouse (solid And B3) and storage field.;	l.	Well in;
m.	Reef Flattening.		

Table 2.3.3. Type and Description of Development

Table 2.3.4. Description of Environmental Component

1. Land

- a. Status of Land;
- b. Utilization of land; c. Susceptible on natural disaster (earthquake, floods, slide);

- d. Chemical physical quality and type of land (enclosure the result of testing).
 2. Source of water (water of surface and ground water) a. Rate of flow (to water of surface and ground water) high of wave and ebb (to water sea); b. Allotment of it;
 - c. Distance with location plan activity;
 - d. Chemical physical quality (Enclosing the test result of laboratory) that compare with quality of existing environment (as instruction letter of Governor/ Decree of Minister/ Government Regulation.
- 3. Air and Noise

a. Air quality and level noise both the source and/or surrounding of location plan activity according to dominant wind direction. Enclosure the result of testing laboratory.

b. Climate Circumstance (climate data covering temperature, dampness, rainfall, wind and rain day. Special of wind that covers wind speed and direction expressed in table and "Wind Rose "monthly).

4. Flora and Fauna a. Mentioning the type of flora and fauna both water and land, which are find in location and

- b. Explaining whether rareness fauna and flora type that protected.
- 5. Social life, Economic Culture

Description as brief and clear of people condition around the location plan activity from aspect population (amount according to type, old, and the density), source of income, education level, earnings level, health condition, religion, mores, perception society, and discipline and security level. 6. Others

a. Description about the sensitive district / crisis that related to supporting environment (protected forest, preserve, cultural pledge, district of tourism, etc. b. Expression the regional space order general plan, where plan activity reside in.

Table 2.3.5. Type of Impacts to be Covered

1. Impact to Natural Resources
a. Impact on coastal conservation (such: erosion, sedimentation);
b. Impact on hydro oceanography (the changing of stream flow, Rise and fall of the tide);
C. Impact on sea biology (mangrove, grass sea, coral).
2. Impact on Chemical Physical
a. Source of Impact;
b. Type and Potency of Impact;
c. Characteristic and measurement of impact.
3. Impact on Biological
a Source of Impact;
b. Type and Potency of Impact:
c. Characteristic and measurement of impact.
4. Impact to Social, Economic and Culture
a. Source of Impact;
b. Type and Potency of Impact;

2.3.2. Present Environmental Conditions

(1) Social environment

The following statistical data from to are shown in **Appendix** from **2.3.1.** to **2.3.9**.

Population density by province (**Appendix 2.3.1.**) Land utilization

- a. Land utilization by province (**Appendix 2.3.2**.)
- b. Land use certification by type of certification by province (Appendix 2.3.3.)

c. Forest concession figures by province (**Appendix 2.3.4**.) Economic activities

- a. Number of fishing households by province (Appendix 2.3.5.)
- b. Number of fishing households, fishing boats, fish cultured areas and quantity of productions by province (**Appendix 2.3.6.**)
- c. Fish culture areas by province and type of fish culture (Appendix 2.3.7.)
- d. Harvested area of paddy by province (Appendix 2.3.8.)
- e. Number of drilling well by company/island, location and type (Appendix 2.3.9.)

(2) Natural environment

The following statistical data from to except Mangrove forest (-l.) are shown in **Appendix** from **2.3.10** to **2.3.25**.

Sea bed and sand wave conditions

- See Section 2.2.2.(1). and 2.2.2.(2).
- National park and nature preservation, etc.
- a. Number and area of land conservation by province (Appendix 2.3.10.)

b. Number and area of marine conservation by province

(Appendix 2.3.11.)

c. Potential national park area by province, name, location and area of natural park by province (**Appendix 2.3.12**.)

d. Name, location and area of grand forest park by province

(Appendix 2.3.13.)

- e. Name, location and area of national park by province (Appendix 2.3.14.)
- f. Name, location and area of conservation area by province (Appendix 2.3.15)

g. Name, location and area of wild life conservation by province (Appendix 2.3.16.)

h. Name, location and area of hunting park by province (Appendix 2.3.17.)

i. List of fixed marine conservation area (excluding marine park) in several provinces (**Appendix 2.3.18**.)

j. List of fixed conservation area (excluding marine park) in several provinces (**Appendix 2.3.19**.)

k. Mangrove forest

Mangrove forest is one of endangered forest in Indonesia. Generally, mangrove forests in Indonesia are in critical condition. Fishpond entrepreneurs for various fish such as shrimp, mangrove wood for charcoal and even settlement activities have destroyed this natural forest.

Mangrove forests have been played an important role in their function for erosion prevention, coastal abrasion prevention and habitat of invaluable fish regeneration.

Rehabilitation efforts such as planting and seeds programs on mangrove forests have been carried out since 1993.

Valuable animals and plants

- a. Number of species fauna protected for last 10 years (Appendix 2.3.20.)
- b. List of protected mammals (Appendix 2.3.21.)
- c. List of protected aves (Appendix 2.3.22.)
- d. List of protected reptilians (Appendix 2.3.23.)
- e. List of protected orchidaceae, diputerocarpaceae, bivalvia, pisces and palmae (Appendix 2.3.24.)
- f. List of protected insects (Appendix 2.3.25.)

(3) Environmental pollution

Following statistical data from to are shown in **Appendix** from **2.3.26** to **2.3.33**.

Air pollution

- a. Air pollution load from manufacturing industry by province (Appendix 2.3.26.)
- b. Air pollution load from constant source (fuel consumption) by province (**Appendix 2.3.27**.)
- c. Air pollution load from mobile source (fuel consumption) by province (Appendix 2.3.28.)
- d. Estimation of HC emission from motorized vehicle by province/island and type of vehicle (**Appendix 2.3.29**.)
- e. Estimation of NOx emission from motorized vehicle by province/island and type of vehicle (**Appendix 2.3.30**.)
- f. Estimation of CO emission from motorized vehicle by province/island and type of vehicle (**Appendix 2.3.31**.)

Water pollution

- a. Liquid waste loading and water pollution by province and the pollutant (Appendix 2.3.32.)
- b. Monthly average oncentration of Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Solid Suspense (SS) parameter in river basin along North Sumatra River by place of taking sample (Appendix 2.3.33.)

2.4. Sea Lanes

2.4.1. Background of Sea Lanes

Indonesia was recognized as an archipelagic state by the UNCLOS in 1994. This status has given the nation responsibilities for efficiently monitoring maritime traffic in its territorial waters. Most of the traffic between the Indian Ocean and the Pacific Ocean flows through the Malacca and Singapore Straits placed under the joint control of Malaysia and Singapore by their VTS systems. Other parts of the traffic use three Indonesian routes which are:

- (1) Sunda Strait / Java Sea / Karimata Strait;
- (2) Lombok / Makassar Straits;
- (3) Indian Ocean / Banda Sea / Maluku Sea.

GOI decided to regulate the maritime traffic by defining three sea lanes in the straits and applied them to the IMO in August 1997. After the investigation in the IMO, they were adopted on May 19th 1998, in the resolution MSC.72(69) titled "Adoption, Designation and Substitution of Archipelagic Sea Lanes" annexed with "Partial System of Archipelagic Sea Lanes in Indonesian Archipelagic Waters" as shown in **Appendix 2.4.1**. The annex defines three sea lanes as Sea Lane I, II and III (A,B,C,D) in accordance with GOI's application as shown in **Figure 2.4.1**.

In UNCLOS, it is stated that ships of all states enjoy the right of innocent passage through archipelagic waters (Article 52), and an archipelagic state may designate sea lanes suitable for the continuous and expeditious passage of foreign ships through its archipelagic waters and the adjacent territorial sea (Article 53). These sea lanes must include all normal passage routes used as routes for international navigation. Under UNCLOS Article 53, archipelagic sea lanes are defined by a series of continuous axis lines from the entry points of passage routes to the exit points. Ships cannot deviate more than 25 nautical miles to either side of such axis lines and navigate too close to the coast.

The navigation safety and efficiency in the sea lanes, where traffic is expected to rise in the future, should be enhanced through newly arrangement of light buoys / beacons / houses, enacting navigation rules, the establishment of TSS / VTS and other appropriate measures for safe navigation. Such policy might also contribute to the development of hub-type services in Indonesia as substitutes for calls to Singapore.



Figure 2.4.1. Archipelagic Sea Lanes in Indonesian Waters

2.4.2. Covering Area of the Sea Lanes in Indonesian Waters

(1) The Straits of Malacca and Singapore

Malacca Strait and Singapore Strait together form the main seaway connecting the Indian Ocean with the China Sea.

This seaway is also the shortest route for tankers trading between the Persian Gulf and Japan.

Malacca Strait

Malacca Strait is defined as the area lying between the west coasts of Thailand and Malaysia on the northeast, and the coast of Sumatra on the southwest between the following limits:

On the north-west:

A line from Ujung Baka (Pedropunt) (5 ° 40'N, 95 ° 26'E), the northwest extremity of Sumatra, to:

Laem Phra Chao (7 $^\circ$ 45'N, $\,$ 98 $^\circ$ 18'E), the south extremity of Ko Phukit, Thailand.

On the southeast:

A line from Tanjung Piai (1 $^\circ$ 16'N, $\,$ 103 $^\circ$ 31'E), the south extremity of Malaysia, to:

Pulau Iyu Kecil (1 ° 11'N, 103 ° 21'E), thence to:

Pulau Karimum Kecil (1 ° 10'N, 103 ° 23'E), thence to:

Tanjung kedabu (1 ° 06'N, 102 ° 59'E).

Singapore Strait

Singapore Strait is defined as the area lying between the south coasts of Malaysia and Singapore Island on the north and the islands off the coast of Sumatra on the south, between the following limits:

On the west: The southeast limit of Malacca Strait.

On the east:

A line joining Tanjung Penyusop (Datok) (1 $^\circ$ 22'N, 104 $^\circ$ 17'E), the south-east extremity of Malaysia, to:

Horsburgh Lighthouse (1 $^\circ$ 20'N, ~ 104 $^\circ$ 24'E),

thence to:

Pulau Koko (1 $^{\circ}$ 13'N, $\,$ 104 $^{\circ}$ 35'E) lying off the north-east extremity of Pulau Bintan.

Singapore Strait is bounded north by the State of Johor (Peninsular Malaysia) and Singapore Island (The Republic of Singapore), and bounded south by Kepulauan Riau (Bulan Archipelago) and the two large islands of Batam and Bintan (The Republic of Indonesia).

The entire length of the strait is about 60 nautical miles. At the west entrance it is 10 nautical miles wide, and at the east entrance 11.5 nautical miles wide abreast Tanjung Penyusop (1 $^{\circ}$ 22'N, 104 $^{\circ}$ 17'E). South of Singapore Island, between Pulau Sakijang Pelepah (Lazarus Island) and Batu Burhanti (1 $^{\circ}$ 17'N, 103 $^{\circ}$ 51'E), it is only 2.5 nautical miles wide.

(2) Sea Lane I

The geographical positions of the Sea Lane I are defined in the Annex of MSC.72(69) as the axis line from South China Sea to Indian (Hinda) Ocean through Natuna Sea, Karimata Strait, Western Java Sea and Sunda Strait.

The Sea Lane IA is also defined as the spur from north of P. Merapas (lat.01 $^{\circ}$ 52'N, long.104 $^{\circ}$ 55'E) to the point of lat.00 $^{\circ}$ 50'N, long.106 $^{\circ}$ 16.33'E.

(3) Sea Lane II

The geographical positions of the Sea Lane II are defined in the Annex of MSC.72(69) as the axis line from Celebes (Sulawesi) Sea to Indian (Hindia) Ocean through Makassar Strait and Lombok Strait.

(4) Sea Lane III

The geographical positions of the Sea Lane IIIA are defined in the Annex of MSC.72(69) as the axis line from Pacific Ocean to Indian (Hindia) Ocean through Maluku Sea, Seram Sea, Banda Sea, Ombai Strait and Sawu Sea. The Sea Lane IIIB is the spur from the position of lat.03 ° 20'S, long.125 ° 30'E to lat.08 ° 31'S, long.127 ° 33'E via lat.04 ° 00'S, long.125 ° 40'E.

The Sea Lane IIIC is the spur from the position of lat.03 ° 20'S, long.125 ° 30'E to lat.06 ° 44'S, long.132 ° 35'E via lat.04 ° 00'S, long.125 ° 40'E and lat.06 ° 10'S, long.131 ° 45'E.

The Sea Lane IIID is the spur from the position of lat.09 $^\circ$ 23'S, long.122 $^\circ$ 55'E to lat.10 $^\circ$ 58'N, 122 $^\circ$ 11'E.
2.4.3. Marine Traffic Density in the Straits of Malacca and Singapore

 (1) Type-wise Reported Vessel Number to Klang VTS in Malaysia (Year 2000) Total reported vessels for the whole one year of 2000 to Klang VTS close to One Fathom Bank was 55,957. The largest number of the report was 18,283 (30.7%) from container vessels and the second was 13,343 (23.9%) from tankers.

A monthly number of reported vessels ranged from 4,000 to 5,000. On daily basis there were 153 reported vessels. If non-reporting vessels were included, it is estimated that there are more than 200 vessels on daily basis. The details are shown in **Table 2.4.1**.

(2) Visual Observation at One Fathom Bank Light House

Visual observation of ships transiting the Malacca Strait off One Fathom Bank has been yearly carried out since 1988. The largest number of observed vessels was 35,873 in 1999 and the second was 35,263 in 2000. The details are shown in **Table 2.4.2**.

TYPE	JAN	FEB	MAC	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	%
VLCC/DEEPDRAFT CR	237	258	245	257	264	262	245	260	267	277	271	320	3,163	5.65%
TANKER VESSEL	998	993	1,072	1,117	1,168	1,076	1,209	1,220	1,134	1,149	1,121	1,086	13,343	23.85%
LNG/LPG CARRIER	237	225	223	225	249	270	265	277	241	238	247	265	2,962	5.29%
CARGO VESSEL	427	503	502	521	584	601	642	613	551	553	539	567	6,603	11.80%
CONTAINER VESSEL	1,391	1,324	1,519	1,448	1,536	1,512	1,571	1,620	1,567	1,617	1,562	1,616	18,283	32.67%
BULK CARRIER	355	356	388	390	420	408	413	424	400	430	354	370	4,708	8.41%
RORO/CAR CARRIER	127	119	137	156	154	140	150	143	152	171	156	156	1,761	3.15%
PASSANGER VESSEL	280	298	319	258	282	257	285	265	237	255	283	282	3,301	5.90%
LIVESTOCK CARRIER	3	3	11	4	10	6	3	2	6	9	5	7	69	0.12%
TUG/TOW VESSEL	43	51	80	44	58	64	68	81	69	80	78	56	772	1.38%
GOV/NAVY VESSEL	3	11	5	14	1	20	2	9	20	14	7	8	114	0.20%
FISHING VESSEL	6	3	1	0	2	6	5	10	6	1	3	0	43	0.08%
OTHERS	67	68	67	84	71	61	74	71	63	69	71	69	835	1.49%
TOTAL	4,174	4,212	4,569	4,518	4,799	4,683	4,932	4,995	4,713	4,863	4,697	4,802	55,957	100%
%	7.46%	7.53%	8.17%	8.07%	8.58%	8.37%	8.81%	8.93%	8.42%	8.69%	8.39%	8.58%	100%	

 Table 2.4.1. Type-wise Reported Vessel Number to Klang VTS (Year 2000)

Source:MRCC Marine Department Malaysia

Year	Total	Tanker	Container	Gen Cargo	Tug	Fishing	Ro-Ro	Passenger	Naval	Others
1988	34,706	13,621	3,508	12,551	1,489	2,358	614	251	314	
1989	32,728	12,222	4,753	11,210	1,311	1,907	805	209	311	
1990	31,831	11,298	4,506	11,502	1,316	1,773	738	243	413	42
1991	30,351	10,719	4,658	10,658	1,457	1,262	852	212	464	69
1992	32,949	11,307	5,397	11,554	1,386	1,477	1,104	314	373	37
1993	33,998	11,177	5,582	12,298	1,405	1,544	1,284	257	388	63
1994	34,446	11,069	5,744	12,320	1,579	1,622	1,130	440	486	56
1995	30,251	8,915	5,149	10,386	1,765	1,743	1,218	649	426	
1996	31,672	9,815	5,787	10,437	1,920	1,606	1,226	554	327	
1997	28,894	8,924	5,286	10,092	1,615	1,227	1,091	437	222	
1998	33,933	10,537	6,853	10,994	1,987	1,366	1,272	727	193	4
1999	35,873	10,948	8,388	10,893	1,909	1,652	1,226	667	188	2
2000	35,263	10,445	8,342	11,324	1,733	1,442	1,152	615	208	2

Table 2.4.2. Visual Observation of Ships Transiting the Malacca Straits off One Fathom Bank Lighthouse(1988-2000)

Source:MRCC Marine Department Malaysia

2.4.4. Marine Traffic Density in Sea Lane I (Sunda Strait)

(1) 1st Marine Traffic Density Survey in Sunda Strait

As Sunda Strait is the narrowest strait in the Sea Lane I, the 1st density survey for marine traffic in Sunda Strait was carried out for continuous 48 hours from1400 local time on May 15^{th} to the same local time on May 17^{th} 2001.

Method of the Survey

Ship's name "PANAH(Arrow)-207" of GAMAT's Class II vessel at the port of Tanjung Priok was chartered by the Study Team for three days to implement this survey in Sunda Strait. The survey vessel left the Port of Tanjung Priok at 0830 hours on May 15th 2001 and arrived at the survey site at 1330 hours on the same day and anchored. The survey site was off the south of Sangiang Island at the position of Lat.5 $^{\circ}$ 59'S, Long.105 $^{\circ}$ 50'E in Sunda Strait. The density of the marine traffic survey was carried out for continuous 48 hours by radar plotting and sighting by binocular.

Gate Line A and B were drawn into the map as shown in **Figure 2.4.2**. The observers entered various ship's data into log sheet, when a vessel crossed the Lines. The particulars of passing vessels were estimated by surveyor's experience.

Result of the Survey

During the 48 hour survey period, the Study Team sighted a total of 108 passing through vessels and few number of small boats engaged in fishing.

It was observed that main passage of Sunda Strait was Gate Line A. 86(80%) vessels out of 108(100%) passed through this passage. The hourly maximum number of operating fishing boats in the vicinity of Gate Line A and B was observed 5 and 24 respectively.

There were 66 vessels that passed through the Gate Line A and B excluding passing fishing boats. Regarding the operating fishing boats, as they were locating close to the coast of islands, there were no boats to obstruct the passing through vessels as long as this observation.

The data log for this survey is shown in **Appendix 2.4.2**. and the results of 1^{st} Marine Traffic Density Survey in Sunda Strait are listed in **Table 2.4.3**. / **2.4.4**.



Figure 2.4.2. 1st Density Survey Map of Sunda Strait

Table 2.4.3. Result of 1 st Density Survey for continuous48 Hours in Sunda Strait

1st I (From 1400h	Density Survey ours May 15th 1	Gate Line A Sunda Strait East Channel	Gate Line B Sunda Strait West Channel		
		Tanker	9	5	4
Sunda Strait		Cargo Boat	23	15	8
Northbound	58	Ferry Boat	0	0	0
(48hours)		Fishing Boat	25	24	1
()		Towing Vessel	1	1	0
		Tanker	5	4	1
Sunda Strait		Cargo Boat	23	19	4
Southbound	50	Ferry Boat	4	3	1
(48hours)		Fishing Boat	17	15	2
· · · · ·		Towing Vessel	1	0	1
				Gate Line A	Gate Line B
Total	108	Vessels		86	22

Table 2.4.4.	Sighted Number of Engaged Fishing Boat per Hour							
in Sunda Strait								

-					
	Vicinity of	Vicinity of		Vicinity of	Vicinity of
May 15th, 2001	Gate Line A	Gate Line B	May 16th, 2001	Gate Line A	Gate Line B
, , , , , , , , , , , , , , , , , , ,			÷		
1400	4	3	1400	0	3
1500	1	3	1500	1	2
1600	5	4	1600	1	2
1700	3	11	1700	1	18
1800	3	12	1800	2	20
1900	3	12	1900	3	22
2000	2	12	2000	3	24
2100	2	18	2100	3	24
2200	2	20	2200	3	24
2300	2	18	2300	3	24

May 16th, 2001	Vicinity of Gate Line A	Vicinity of Cate Line B	May 17th, 2001	Vicinity of Gate Line A	Vicinity of Gate Line B
0000	2	20	0000	2	24
0100	2	18	0100	2	24
0200	3	21	0200	2	24
0300	2	22	0300	2	19
0400	2	20	0400	2	19
0500	0	20	0500	0	18
0600	0	0	0600	0	4
0700	0	3	0700	0	4
0800	0	4	0800	0	4
0900	0	2	0900	0	3
1000	0	2	1000	0	2
1100	0	1	1100	0	1
1200	0	1	1200	0	1
1300	0	2	1300	0	1
	· · · · ·		1400	0	1
		,	Gate Line /	A <u>Maximum</u>	5
		!	Gate Line J	8 Maximum	24

Table 2.4.4. is continued.

(2) 2nd Marine Traffic Density Survey in Sunda Strait

Ship's name "PANAH(Arrow)-203" of GAMAT's Class II vessel at the Port of Tanjung Priok was chartered by the Study Team for three days to implement this survey in the similar way as 1st survey in Sunda Strait. The survey vessel left the Port of Tanjung Priok at 0900 hours on Oct. 18th 2001 and arrived at the survey site, 1 mile west of Tempurung Island, at 1500 hours on the same day and drifted until 1300 hours on Oct. 20th 2001.

Gate Line A and B were drawn into the map as shown in **Figure 2.4.3**. During the 46 hour survey period the Study Team sighted and observed a total of 103 passing through vessels as shown in **Table 2.4.5**. and vessel traces with crossing ferryboats are shown in **Figure 2.4.4**. Data log is shown in **Appendix 2.4.3**.



Figure 2.4.3. 2nd Density Survey Map of Sunda Strait

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Table 2.4.5. Result of 2 nd Density Survey for continuous46 Hours in Sunda Strait

2nd De r (From 1500hour	nsity Surve rs Oct. 18th 1	Gate Line A Sunda Strait East Channel	Gate Line B Sunda Strait West Channel		
		Tanker	5	4	1
Sunda Strait		Cargo Boat	42	33	9
Northbound	51	Container Vessel	2	0	2
	51	Passenger Boat	0	0	0
(46hours)		Fishing Boat	2	2	0
		Towing Vessel	0	0	0
		Tanker	10	9	1
Sunda Strait		Cargo Boat	36	20	16
Sunda Stratt	59	Container Vessel	3	1	2
Southbound	52	Passenger Boat	2	1	1
(46hours)		Fishing Boat	0	0	0
		Towing Vessel	1	1	0
		Gate Line A	Gate Line B		
Total	103	Vessels		71	32

(3) Crossing Number by Ferry and High-speed Boats in Sunda Strait There is only one ferryboat traffic route which connects Jawa Island and Sumatera Island. The former port is Merak and the latter is Bakauheni.

A ferryboat departs from each port every 24 minutes through 24 hours and it makes 60 crossings a day from each port as of December 2001. A total crossing number by ferryboats in Sunda Strait is **120 a day** if kept on schedule in the time table. There were 21 ferryboats as of May 2001 in various sizes from the smallest **1,376 GRT** to the largest **6,095 GRT**.

In addition to the ferryboat service, high-speed boat service carrying just passengers started in 1997. The crossing number by the high-speed boats is **27 a day** from each port and **54 a day** in Sunda Strait if kept on schedule.

The total number of marine traffic combined ferryboats and high-speed boats is $174 \ a \ day$. As the statistics of the actual crossing is about 10 percent less due to the continuous delay from the announced schedule, it is reasonable to use the figure of $156.6 \ a \ day$.

The statistics of the ferryboats at Port of Merak and Bakauheni in 1999 / 2000 are shown in **Table 2.4.6**. and, combined statistics of Merak and Bakauheni in **Table 2.4.7**.



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Figure 2.4.4. Vessel Traces during 2nd Density Survey for continuous 46 Hours in Sunda Strait

Number of Vessel Traces: 303 vessels

		Merak		Bakau	uheni
Ticket Type		1999	2000	1999	2000
Total Round	High-Speed Boat	4,655	5,512	4691	5,578
Trip (Times)	Ro-Ro Ferryboat	18,620	17,680	18,585	17,642
	Total	23,275	23,192	23,276	23,220
	High-Speed Boat	475,730	562,715	464,129	556,518
Passenger	Ro-Ro Ferryboat	5,412,790	5,443,699	6,588,804	6,332,178
	Total	5,888,520	6,006,414	7,052,933	6,888,696
Vehicles	(Units)	1,057,935	1,134,199	1,012,879	1,093,454
Cargoes	(Tons)	3,052,150	3,205,185	3,553,740	3,967,784

Table 2.4.6. Statistics of Ferryboat Services at Merak and Bakauheni

Source: Pt. ASDP (PERSERO) Cabang Utama Merak, Bakauheni

Table 2.4.7. Statistics of Ferryboat Service in Sunda Strait (Between Merak and Bakauheni)

Ticket Type	1996	1997	1998	1999	2000
Speed Boat Passenger	552,090	1,002,012	1,031,929	939,859	1,119,233
Ro-Ro Ferry Passenger	13,131,229	12,334,729	12,940,209	12,001,594	11,775,877
Total Passenger	13,683,319	13,336,741 (2.53% Less)	13,972,138 (4.76% Plus)	12,941,453 (7.38% Less)	12,895,110 (0.36% Less)
Total Vehicles	1,685,529	1,898,577	1,962,762	2,070,814	2,227,653
Cargo (Ton)	6,028,031	6,780,874	5,900,039	6,605,890	7,172,969

Source: Pt. ASDP (PERSERO) Cabang Utama Merak, Bakauheni

(4) Fishing Ground

There is no good fishing ground in the vicinity of middle lane of Sunda Strait.

(5) Estimate of Daily Through-Traffic in Sunda Strait

Estimate by the result of 1st Density Survey

The daily through-traffic in Sunda Strait based on ^{§t} marine traffic density survey is estimated as follows;

58 traffics a day
1
25
2
7
23 (including Bulkers)
-

Estimate by the result of 2nd Density Survey

The daily through-traffic in Sunda Strait based on 2^d marine traffic density survey is estimated as follows;

Total	53.6 traffics a day
Others	0.5
Fishing Boat	1.0
Passenger Boats	1.0
Containers	2.6
Tankers	7.8
Cargo Vessels	40.7

Estimate of Daily Traffic in Sunda Strait

The daily traffic in Sunda Strait except local fishing boats engaged in fishing operation through average result of P^t and 2nd marine traffic density survey is estimated as follows;

Total		217.4	traffics a day
Others (Leis	sure Boat, etc.)	5	
		(10% less than t	he schedule)
Ferryboat (N	Aerak Bakau	iheni) 156.6	
Through-Tra	affic	55.8	

2.4.5. Marine Traffic Density in Sea Lane II (Lombok Strait)

(1) Marine Traffic Density Survey in Lombok Strait

As Lombok Strait is the narrowest strait in the Sea Lane II, the density survey for marine traffic was carried out for continuous 48 hours started from 1400 local time on May 18^{th} until the same local time on May $20^{th} 2001$.

Method of the Survey

KN Mizan of Navigasi vessel at port of Benoa was chartered by the Study Team for three days to implement this survey in Lombok Strait. The vessel left the Port of Benoa at 1100 hours on May 18^{th} 2001 and arrived at the survey site at the position of Lat.8 ° 30'S, Long.115 ° 38'E in Lombok Strait. During the survey period the vessel drifted and moved in the vicinity of the above initial position.

The survey was carried out for continuous 48 hours by radar plotting and sighting by binoculars. Gate Line No.1 and No.2 were drawn into the nautical chart as shown in **Figure 2.4.5**.

The observers entered various ship's data into log sheet when crossing the Gate Lines. Particulars of passing vessels were confirmed by contacting with VHF as long as applicable.

The number of boats engaged in fishing was hourly counted by sighting within the visibility from the survey vessel.

Result of the Survey

During the 48 hour survey period the Study Team sighted / detected a total of 74 vessels passing Gate Line No.1 and No.2.

It was observed 55(75%) of ferryboats out of total 74(100%) and this figure showed that major traffic in Lombok Strait was made by ferryboats which were mostly routed between Padangbai in Bali Island and Lembar in Lombok Island.

There were 16 passing through vessels in Lombok Strait and six (6) vessels in Badung Strait that is located west of Penida Island. There was no ULCC (Ultra Large Crude Carrier) during this survey period and even the largest vessels were less than 100,000 Gross Tonnage.

Regarding the engaged fishing boats, as they were locating close to the coast of islands, there was no boat to obstruct the passing through vessels as long as this observation.

The data log for this survey is shown in Appendix 2.4.4. and its result figure in Table 2.4.8./2.4.9.



Figure 2.4.5. Map of Lombok Strait

Table 2.4.8. Result of Density Survey for continuous48 Hours in Lombok Strait

			Tanker	2
Lombok Strait Passing Through Vessel	N o r t h b o u n d	8	Bulker	6
			Fishing Vessel	0
			Tanker	2
	Southound	8	Bulker	5
			Fishing Vessel	1
Crossing Vessel	Ferry	5 1		
Podung Stroit	N o r t h b o u n d	3		
bauung strait	Southound	3		
	Total	74	Vessels	
			-	

May 18th	Total	May 19th	Total	May 19th	Total	May 20th	Total
2001	Number	2001	Number	2001	Number	2001	Number
1400	1 2 0	0000	0	1400	0	0000	0
1500	163	0100	0	1500	9	0100	0
1600	103	0200	0	1600	5	0200	0
1700	2 2	0300	0	1700	1	0300	0
1800	5	0400	0	1800	0	0400	0
1900	5	0500	2	1900	0	0500	4
2000	0	0600	3	2000	0	0600	2
2100	0	0700	10	2100	0	0700	150
2200	0	0800	15	2200	0	0800	2 0
2300	0	0900	11	2300	0	0900	10
2400	0	1000	0	2400	0	1000	1
		1100	2			1100	0
		1200	0			1200	2
		1300	0			1300	1
				-		1400	0

Table 2.4.9. Sighted Number of Engaged Fishing Boat per Hourin Lombok Strait

(2) ULCC (Ultra Large Crude Carrier)

Up to the beginning of 2000, there was only one ULCC named "Nissei Maru". She regularly serviced between Japan and the Persian Gulf through Lombok Strait but she was sold to scrap in January 2000. As of January 2002, there was **no ULCC** carrying crude oil from the Persian Gulf to East Asia through Lombok Strait according to ULCC's chartered condition provided by Internet as shown in **Appendix 2.4.5**. (ULCC Particular List) and **Appendix 2.4.6**. (ULCC Chartering Condition).

(3) Container Vessel Traffic in Lombok Strait

Shipping schedule of container vessels from Singapore to Australia / New Zealand is easily obtained through Internet. According to the schedule of one month from Jul. 3^d to Aug. 2^d, container vessels are estimated to pass Lombok Strait about 38 traffics a month as shown in **Table 2.4.10**. In the period of 2 weeks of container feeder service showed in **Table 2.4.11**. indicates 36 traffics a month. Altogether it comes to estimate 74 traffics a month and 2.5 traffics a day.

D	<u> </u>	0		1
Destination	V e s s e l	Start Date	End Date	NO.
Sydney - Australia	APL Ivory V.39S	03-Jul-01	15-Jul-01	1
Sydney - Australia	APL Ivory V.40S	31-Jul-01	12-Aug-01	2
Brisbane - Australia	Fei Yun he V.558	19-Jul-01	29-Jul-01	3
Auckland - New Zealand	Haruna Maru V.22S	07-Jul-01	19-Jul-01	4
Brisbane - Australia	Hua Yun He V.560	26-Jul-01	05-Aug-01	5
Fremantle - Australia	Montreal Senator V.09A	06-Jul-01	12-Jul-01	6
Fremantle - Australia	Montreal Senator V.10A	20-Jul-01	26-Jul-01	7
Fremantle - Australia	MSC Indonesia V.142A	13-Jul-01	19-Jul-01	8
Fremantle - Australia	MSC Indonesia V.143A	27-Jul-01	02-Aug-01	9
Sydney - Australia	NYK Pride V.10S	17-Jul-01	29-Jul-01	10
Auckland - New Zealand	P&O Nedlloyd Taranaki V.23S	12-Jul-01	25-Jul-01	11
Auckland - New Zealand	P&O Nedlloyd Taranga V.22S	20-Jul-01	01-Aug-01	12
Sydney - Australia	P&O Nedlloyd Adelaide V.41S	24-Jul-01	05-Aug-01	13
Auckland - New Zealand	P&O Nedlloyd Lyttelton V.23S	26-Jul-01	08-Aug-01	14
Brisbane - Australia	Patsy N V.557	05-Jul-01	15-Jul-01	15
Adelaide - Australia	Postsdam V.11S	14-Jul-01	31-Jul-01	16
Sydney - Australia	Potsdam V.11S	14-Jul-01	26-Jul-01	17
Brisbane - Australia	T . B . N .	02-Aug-01	12-Aug-01	18
Brisbane - Australia	Teng Yun He V.559	19-Jul-01	29-Jul-01	19

Table 2.4.10. Schedule of Container Vessels from Singapore Oceaniathrough Internet Home Page

Source: Worldgate Express Lines Pte. Ltd. Shipping Schedule SystemInternet Home Page

Table 2.4.11. Schedule of Container Vessels from Singapore to Ocea niathrough Indonesia Shipping Gazette

Destination	Vessel	Start Date	End Date	N o .
Sydney - Australia	Bunga Teratai V.137	06-Jun-01	15-Jun-01	1
Sydney - Australia	Bunga Teratai 2 V.139	14 - Jun - 01	23-Jun-01	2
Brisbane - Australia	Bunga Delima V.851	19-Jun-01	30-Jun-01	3
Wellington - New Zealand	K. Wirawan V.881	10-Jul-01	28-Jul-01	4
Brisbane - Australia	K. Wijaya V.841	12 - Jun-01	23-Jun-01	5
Brisbane – Australia	K. Wangi V.861	26-Jun-01	07-Jul-01	6
Brisbane - Australia	Bunga Teratai 4 Voy.871	3 - J u l - 0 1	14-Jul-01	7
Fremantle - Australia	O O C L A c e V.017	12 - Jun-01	17-Jun-01	8
Fremantle – Australia	OOCL Ability V.079	26-Jun-01	01-Jul-01	9

Source: Indonesia Shipping Gazette May 28, 2001

(4) Ferryboats in Lombok Strait

There is a ferryboat service between Padangbai of Bali Island and Lembar of Lombok Island. The frequency of the ferryboat service are 16 departures from each port a day at an interval of 1.5 hours as of May 2001.

There were 15 ferryboats as of May 2001 in various sizes from the smallest 640 GRT to the largest 1,645 GRT.

The statistics of ferryboat transportation on a route from Padangbai to Lembar in 2000 is listed in Table 2.4.12.

Table 2.4.12.	Statistics of Ferryboat Transportation in 2	000
	(Padangbai -Lembar)	

	(,	
Items	Number of Trip	Carried Passenger	Carried Vehicle
Route	(Times)	(Person)	(Units)
Padangbai - Lembar	11,086 / year (30.4 / day)	905,657 / year	206,528 / year

(5) Local Fishing Boat

There is no good fishing ground in the vicinity of middle lane of Lombok Strait. According to the 48 hour density survey it was sighted hourly maximum of 163 boats on the first day and 150 boats on the second day as shown in **Table 2.4.9**. The average number of hourly maximum is 156.5.

(6) Estimate of Daily Through-Traffic in Lombok Strait

The estimate of daily through-traffic of Lombok Strait under the 48 hour traffic survey and the reviewed result from the announced schedule are as follows;

Total	12.5 traffics a day
Ocean Going Fishing Boat	2
Containers	2.5
Tankers	2
Bulkers	6
Bulkers	6

(7) Estimate of Daily Traffic in Lombok Strait

The daily traffic in Lombok Strait except local fishing boats engaged in fishing operation is estimated as follows;

Total	559 traffics a day
Others (Leisure Boat)	10
Badung Strait (Port of Bunoa)	3
Ferryboat (Padangbai – Lembar)	30.4
Through-Traffic	12.5
Through-Traffic	12.5

2.4.6. Marine Traffic Density in Sea Lane III (Maluku Sea)

(1) Marine Traffic Density Survey in Sea Lane III, sea area between Mayu Island and Halmahera

Sea Lane III is a main traffic route for the sea trade between North-East Asia and North-West Australia. Especially most of carriers of LNG, ore, coal and container bound for Japan from North-West Australia takes this sea lane because of the shorter navigation passage.

Sea Lane III consists of one main route and other several connected spurs. It is very difficult to estimate each traffic distribution without traffic density survey.

Method of the Survey

The density survey for marine traffic between Mayu Island and Halmahera was carried out for continuous 48 hours started from 1200 local time on $Oct.13^{th}$ until the same local time on $Oct.15^{th}$ 2001.

KN "MERAK" of Navigasi vessel at Port of Bitung was chartered by the Study Team for three days to implement this survey in Marku Sea. The vessel left the port of Bitung at 0500 hours on Oct.13th 2001 and arrived at the survey site at the position of Lat.1 ° 12'N, Long.115 ° 30'E in Marku Sea. During the survey period the vessel drifted and moved in the vicinity of the above initial position.

The survey was carried out for continuous 48 hours by operation of radar plotting and sighting by binocular. Gate Line was drawn into the nautical chart as shown in **Figure 2.4.6**.

Result of the Survey

During the 48 hour survey period the Study Team sighted / detected a total of 13 vessels passing the Gate and 2 vessels crossing eastward / westward. The largest vessel was a bulk carrier with carrying iron ore from Port Dampier, Australia to Kimitsu, Japan, which had the particulars of Gross Tonnage 101,222 and Length Over All 300m. The traffic summary is shown in **Table 2.4.13**. and the data log is shown in **Appendix 2.4.7**.



Figure 2.4.6. Map of the Sight of Mar ine Traffic Survey at Maluku Sea

Table 2.4.13. Result of Marine Traffic Density Survey in Maluku Seafor Continuous 48 Hours

Sea Lane III,		Northbound	9	Tanker Bulker	1 6
Maluku Sea between	aluku Sea between Total 13 Mayu Island and Vessels Halmahera			Cargo Boat	2
Mayu Island and			4	Tanker	0
Halmahera		Southound		Bulker	4
				Cargo Boat	0
In the Vicinity of	Totol 9	Crossing	2	Bunker Barge	1
ahove area	TOTAL Z Vessels	Vessel		Cargo Boat	1
usore area		Local Fishing Boat	0		

Grand Total 15 Vessels

(2) Estimate of Traffic Quantity through Australian Route

The traffic quantity through Sea Lane III on the route from the Pacific Ocean / the South China Sea to Australian ports is estimated as shown in **Table 2.4.14**. and the route-wise calling vessel list in Port Darwin for one year from July 2000 to June 2001 is shown in **Appendix 2.4.8**.

The total quantity of passing through vessels in Sea Lane III through

Australian route was estimated 946.2 vessels per year and 2.59 vessels per day.

Regarding LNG carriers having a regular service between North-west Australia and Japan there are eight (8) vessels in an interval of 20 day round as of January 2002. It is equivalent to about 36 trips a year per vessel and **0.79 trips a day** for eight (8) LNG carriers.

Port Lane	Albany Port	Darwin	Port Dumpier	Fremantle	Geraldton	Port Headland	Weipa	Total
Total Vessel Called (2000)	141	512	1,729		248	603	302	
<u> </u>			<u> </u>	<u> </u>			<u> </u>	
IIIA	*47.0/year (0.13 / day)			***192 / yr (0.53 / day)	*82.7 / year (0.23 / day)			321.7/year (0.88/day)
IIIA-IIIB		**85.0/year (0.23 / day)						85.0/year (0.23/day)
IIIA-IIIC							*50.3 /year (0.14 / day)	50.3/year (0.14/day)
IIIA-IIID			**288.2/yr (0.78 / day)			*201 / year (0.55 / day)		489.2/year (1.34/day)
						Sea Lane	III Total	946.2/year (2.59/day)

Table 2.4.14. Estimate of Traffic Quantity through Australian Route

Source: Home Page of Port Authority: Albany Port Authority, Darwin Port Authority, Port Dampier Authority, Fremantle Port Authority, Geraldton Port Authority, Port Headland Port Authority, Weipa Port Authority *Marked : Estimated the traffic in one third of yearly volume

**Marked: Estimated the traffic in one sixth of yearly volume

***Marked: Estimated the traffic through vessel port call list which was provided by Fremantle Port Authority and listed port names of last port and next port for latest one year.

(3) Estimate of Daily Through Traffic in Maluku Sea of Sea Lane III between Mayu Island and Halmahera by continuous 48hours Density Survey The quantity of daily through traffic in Maluku Sea of Sea Lane III is estimated through the Density Survey and shall be added LNG daily trip figure of 0.79 as never sighted during the Density Survey period.

Total	7.29 traffics a day
LNG Carrier (Australia – Japan)	0.79
Marine Traffic Density Survey	6.5

- **2.4.7. Summary of Daily Marine Through** -**Traffic Density in Year 2001** The estimated daily marine through-traffic density of each sea lane in year 2001 is summarized as follows;
 - (1) The Straits of Malacca and Singapore at One Fathom Bank

The total through-traffic is estimated about **200** vessels a day by the Klang VTS report as mentioned in **Section 2.4.3.(1)**.

(2) Sea Lane I

Sunda Strait

It is estimated about **60** vessels a day based on the marine traffic density survey carried out by the Study Team as mentioned in **Section 2.4.4.(5)**. Karimata Strait

Weekly Indonesia Shipping Gazette shows the schedule of container vessel and feeder boat. The Study Team reviewed the number of through-traffic at Karimata Strait through the Gazette on the edition of May 14, May 21 and May 28, 2001 as per **Appendix 2.4.9**. The number of through-traffic vessel was estimated about 250 for 45 days, and it is equivalent **6** vessels a day on the assumption that vessels from Singapore Strait or China Sea to Java Sea and vessels from China Sea to Jakarta would pass Karimata Strait.

Therefore, the daily density of trough-traffic is estimated	ted as follows:
Assumed 1/3(33.3%) from Sunda Strait	20 vessels
Estimated number of vessels from North Java,	
Makassar Strait by Indonesia Shipping Gazette	6 vessels
Other vessels	4 vessels
Total	30 vessels

(3) Sea Lane II

Lombok Strait

It is estimated about 13 vessels a day based on the marine traffic density survey carried out by the Study Team as mentioned in **Section 2.4.5.(6)**.

Makassar Strait

It is estimated as follows;	
Assumed 4/5(80%) from Lombok Strait	
Assumed 1/10(10%) from Sea Lane III	
Assumed 1/20(5%) from Sunda Strait	

Assumed 1/10(10%) from Karimata Strait Estimated vessels bound from North Java

Total **20** vessels

vessels
 vessels
 vessels
 vessels

2 vessel

(4) Sea Lane III

IIIA(Maluku Sea between Mayu Island and Halmahera) It is estimated about **8** vessels a day based on the marine traffic density survey carried out by the Study Team as mentioned in **Section 2.4.6.(3)** IIIC

It is estimated as follows;

Assumed 1/4(25%) from route IIIA		2 vessels
Estimated through Australian Route(Table	2.4.14.) 1 vessel
	Total	3 vessels
IIIB		
Assumed 3/8(37.5%) from route IIIA		3 vessels
Estimated through Australian Route (Table	2.4.14.) 1 vessel
	Total	4 vessels
IIID		
Assumed 3/8(37.5%) from route IIIA		3 vessels
Estimated through Australian Route(T a b l e	2.4.14)1 vessel
	Total	4 vessels

(5) Summary of Through-Traffic Density

The daily marine through-traffic density in year 2001 is summarized in Table 2.4.15. and Figure 2.4.7.

	v 0	V	
Name of Sea Lane	Strait	Estimated	
		Daily	
		Through-Traffic	
The Straits of	At One Fathom Bank	200	
Malacca and			
Singapore			
Sea Lane I	Sunda Strait	60	
	Karimata Strait	30	90
Sea Lane II	Lombok Strait	13	
	Makassar Strait	20	33
	IIIA(between Mayu Island	8	
Sea Lane III	and Halmahera)		
	IIIC	3	
	IIIB	4	
	IIID	4	19

Τa	n b l e	2.4.	15.	Daily	Through	-Traffic	Density	in	Each	Sea	Lane
		- W • I •	10.	Duity	Intugn	IIaIII	DUNSILY			Duu	Lunc

Source: JICA Study Team





(6) Estimated Number of Foreign Vessels passing-through Sea Lanes The number of foreign vessels was estimated based on the result of the marine traffic density surveys as shown in Table 2.4.16.

Sea Lane (referred Appendix No.)	Strait	Date Surveyed	Number of Passing- Through Vessels	Estimated Number of Foreign Vessels (percentage)
Sea Lane I	Sunda Strait	14:00hrs May 15 th to 14:00hrs	108	25
(Appendix 2.4.2.)	1 st Survey	May $17^{\text{th}} 2001$	100	(23%)
(Appendix 2.4.3.)	Sunda Strait	15:00hrs Oct. 18 th to 13:00hrs	103	31
	2 nd Survey	Oct. 20 th 2001		(30%)
Sea Lane II	Lombok	14:00hrs May	10	14
(Appendix 2.4.4.)	Strait	May 20 th 2001	10	14 (88%)
Sea Lane III	Maluku Sea between Mayu	12:00hrs Oct.15 th	19	10
(Appendix 2.4.7.)	Island and Halmahera	Oct.17 th 2001	13	(100%)

Table 2.4.16.	Estimated	Num	ber (pe	ercenta	ge) of	Foreign	Vessels
	Passin	g-th	rough	Sea L	anes		

Source: JICA Study Team

It was concluded from the marine traffic density surveys that the ratio of domestic vessels to foreign vessels for the through-traffic in each Sea Lanes was estimated **3 to 1 (foreign vessel ratio: about 25%) in Sunda Strait** of Sea Lane I, **1 to 9 (foreign vessel ratio: about 90%) in Lombok Strait** of Sea Lane II and **0 to 10 (foreign vessel ratio: nearly 100%) in Maluku Sea between Mayu Island and Halmahera** of Sea Lane III.

2.4.8. Traffic Control Operation in the Straits of Malacca and Singapore

Traffic control operations are enforced just in the straits of Malacca and Singapore by the government of Singapore, Malaysia and Indonesia.

(1) Mandatory Ship's Routeing System

Rules and definitions for Vessels

A deep draught vessel is defined as a vessel having a draught of 15 meters or more, and VLCC is defines as a tanker of 150,000 dwt or more. The rules for vessels navigating through the strait of Malacca and Singapore have been adopted by IMO for mandatory use of deep draught vessels, VLCCs and other vessels passing through traffic separation schemes.

Traffic Separation Schemes (TSS)

Traffic separation schemes have been established throughout between off One Fathom Bank and off Horsburgh Light House. There are 8 TSSs during this area as follows.

a. At One Fathom Bank

b. Port Klang to Port Dickson

- c. Port Dickson to Tanjung Keling
- d. Malacca to Iyu Kecil
- e. In the Singapore Strait (Main Strait)
- f. Singapore Strait (Off St. Johns' Island)
- g. Singapore Strait (Off Changi / Pulau Batam)
- h. At Horsburgh Light House Area

(2) Ship Mandatory Reporting System

On December 1st 1998 a new mandatory ship reporting system upgraded from voluntary system was introduced in the Straits of Malacca and Singapore, one of a number now operating in different parts of the world.

Ships of the following categories are required to participate in the ship

reporting system in the Straits of Malacca and Singapore. Vessels of 300GT and above;

Vessels of 50 meters or more length;

Vessels engaged in towing or pushing with a combined GT of 300 and above, or with a combined length of 50 meters or more;

Vessels of any tonnage carrying hazardous, as defined in paragraph I.4 of resolution MSC.43(64);

All passenger vessels that are fitted with VHF, regardless of length or GT;

Any category of vessels less than 50 meters in length or less than 300 GT which are fitted with VHF and in an emergency, uses the appropriate

traffic lane or separation zone, in order to avoid immediate danger.

(3) Vessel Traffic Services (VTS)

There are 3 VTS facilities in the area of the Straits of Malacca and Singapore. The facilities of Klang VTS with 6 radars and Johor VTS with 4 radars are operated by Malaysia, and the facility of Singapore VTS with 4 radars is operated by Singapore.

On receipt of a position message through the mandatory reporting system, operators of the VTS will establish the relation between the ship's position and the information supplied by the facilities available to them. The information on heading and speed will facilitate the VTS operator's task of identifying a ship within a group.

Thus the VTS have been contributing to the safe traffic in the Straits of Malacca and Singapore.

2.5. Maritime Shipping and Traffic

2.5.1. Maritime Transportation System

(1) Condition of Maritime Traffic

Since Indonesia is a country of many islands, sea transportation is very important and strategic to support national development in uniting the whole Indonesian area. Therefore, the development of national sea transportation as well as repair, maintenance and management of port facilities need to be improved and expanded.

Volume of international sea cargo loaded reached 139.3 million tons in 1999, or increased by 4.22 per cent from 1998. Of the total loaded volume, Riau accounted for 24.41 per cent, East Kalimantan contributed 17.19 per cent, South Kalimantan 14.83 per cent, Dista Aceh 19.76 per cent, and the rest was found in other provinces. International sea cargo unloaded decline from 47.14 million tons in 1998 to 43.48 million tons in 1999. Of the total volume, 19.35 per cent was unloaded in Central Java, 18.12 per cent in DKI Jakarta, 18.10 per cent in West Java, and 16.54 per cent in East Java.

The volume of cargo loaded was greater than cargo unloaded for international sea borne cargo, different from inter-island cargo. In 1999, the volume of inter-island cargo loaded was 113.63 million tons, increased by 0.13 per cent from 1998. The Provinces with the most cargo loaded were Riau (24.58 per cent), East Kalimantan (17.86 per cent), South Kalimantan (11.00 per cent), South Sumatra (7.70 per cent), and Lampung (7.20 per cent). In 1999, the volume of inter island cargo unloaded was 122.37 million tons, increased by 2.15 per cent compared to 1998. The seven areas with the most cargo loaded were East Java, Riau, East Kalimantan, West Java, Central Java, South Kalimantan and DKI Jakarta (See **Table2.5.1**.). (Source ; Statistical Year Book of Indonesia 2000)

Table 2.5.1.Volume of Loaded and Unloaded of Inter Island andInternational Sea Borne Cargo by Province 1999Source; STATISTICAL YEAR BOOK OF INDONESIA 2000

					(Ton)			
Provinsi	Antar Inter i	pulau sland	Antar Fore	negeri eign	Jumlah Total				
Province	Bongkar	Muat	Bongkar	Muat	Bongkar	Muat			
	Unloaded	Loaded	Unloaded	Loaded	Unloaded	Loaded			
(1)	(2)	(3)	(4)	(5)	(6)	(7)			
Dista Aceh	617717	2351302	197129	27537569	814846	29888871			
Sumatera Utara	4962855	1920984	1786862	2917945	6749717	4838929			
Sumatera Barat	1980180	2416141	336958	4090056	2317138	6506197			
Riau	15166874	27930183	2545348	34012476	17712222	61942659			
Jambi	1047001	1263284	102856	686293	1149857	1949577			
Sumatera Selatan	1957561	8749102	490564	1927676	2448125	10676778			
Bengkulu	293238	109274	32064	1052451	325302	1161725			
Lampung	1934169	8185994	1835416	2498273	3769585	10684267			
Sumatera	27959595	52926264	7327197	74722739	35286792	127649003			
DKI Jakarta	11637272	4956037	7877882	4928669	19515154	9884706			
Jawa Barat	12901711	1182811	7869316	1982249	20771027	3165060			
Jawa Tengah	12899774	7540631	8412929	2627412	21312703	10168043			
D.I Yogyakarta	0	0	0	0	0	0			
Jawa Timur	16628690	5214671	7192510	6488871	23821200	11703542			
Jawa dan Madura	54067447	18894150	31352637	16027201	85420084	34921351			
Bali	1616842	96981	14271	1155	1631113	98136			
Nusa Tenggara Barat	926330	219896	29700	2000	956030	221896			
Nusa Tenggara Timur	1283579	501550	48618	14564	1332197	516114			
Bali, Nusa Tenggara	3826751	818427	92589	17719	3919340	836146			
Kalimantan Barat	1788635	515797	182830	908781	1971465	1424578			
Kalimantan Tengah	847642	1386662	4097	334983	851739	1721645			
Kalimantan Selatan	12109058	12502032	65695	20668766	12174753	33170798			
Kalimantan Timur	13071420	20295437	3624928	23953526	16696348	44248963			
Kalimantan	27816755	34699928	3877550	45866056	31694305	80565984			
Sulawesi Utara	1305785	754992	71729	333747	1377514	1088739			
Sulawesi Tengah	867333	1411326	0	69204	867333	1480530			
Sulawesi Selatan	2695180	3041726	736264	1073149	3431444	4114875			
Sulawesi Tenggara	1566499	394647	103	321927	1566602	716574			
Sulawesi	6434797	5602691	808096	1798027	7242893	7400718			
Maluku	912752	450375	3483	679355	916235	1129730			
Irian Jaya	1350341	233851	14994	228954	1365335	462805			
Maluku dan Irian Jaya	2263093	684226	18477	908309	2281570	1592535			
Indonesia	122368438	113625686	43476546	139340051	165844984	252965737			

Sumber/Source : Kepala Kantor Cabang Pelabuhan/Chief of Port Office

(2) Shipping

Shipping in Indonesia is divided into the following four forms.

Ocean Going Shipping

This Shipping may be thought that it is about the same as the general idea of Ocean Going Shipping, but it turns around plural domestic ports,

and finally arrives in the foreign country in the neighborhood like Singapore. It is not treated as Ocean Going Shipping but classified as Inter-island Shipping in statistics in Indonesia.

In Indonesia, the fact that handling freight of Ocean Going Shipping is limited to six companies of the following, members of "Indonesia National Lines (INL)".

Because of overwhelming shortage of Indonesian vessels, it is the present condition with freight of Ocean Going Shipping that 96 % is being transported by foreign vessels, and still the ratio is increasing now.



Inter-island Shipping

Inter-island Shipping may be thought that it is about the same as the general idea of Coastal Shipping, but it turns around plural domestic ports, and finally arrives in the foreign country in the neighborhood like Singapore. Such Shipping is included in Inter-island Shipping in Indonesia. And the shipping in the same island such as that from Jakarta to Surabaya is also included in Inter-island Shipping.

Inter-island Shipping includes the following two shipping forms.

a. Traditional Shipping

Inter-island Shipping by small vessels less than 35GT

b. Local Shipping

Inter-island Shipping by medium vessels over 35GT,less than 175GT Pioneer Shipping

The purpose of Pioneer Shipping is to make sure the transportation of passengers and living cargo to support developing islands isolated in the remote place. This shipping has been given financial assistance by Indonesian government. This shipping is done by only PELNI; which is the national company under permission.

Special Shipping

Special Shipping is marine transportation to do chiefly for oneself by using own vessels. An enterprise and so on operates it. It is a national oil enterprise and transports its petroleum by its own oil tankers. PERTAMINA is a typical example of using this type of shipping.

(3) Maritime Traffic Network

Coastal shipping in Indonesia is composed of Inter-island Shipping and Pioneer Shipping. Coastal shipping in Indonesia is a combination of these types of shipping, and transports domestic freight to each region in Indonesia.

Local ports in Indonesia are connected directly with Jakarta or Surabaya, and there are few flows of shipping among local ports.

In Indonesia, Tg.Priok, Tg.Perak, Belawan and Makassar are the most important ports still now, and these four ports are playing central role for coastal shipping network in Indonesia.

2.5.2. National Sea-borne Development Plan, Promotional Policy Though remarkable development was made in many fields in Indonesia, it can be said that overwhelming shortage of vessels has been unchanged since President Soekarno

Actually, foreign shipping companies transported 96 % of ocean going cargo and 53 % of domestic cargo in 1998.

Indonesia has the regulation not to allow foreign vessels to make domestic shipping. If it is actually enforced, the transport of cargo would get stagnate and as a result, Indonesian economy would be a stagnating recession. It is a dilemma for the country. As a matter of fact, the regulation has not functioned.

On the other hand, as for Ocean Going Shipping, under the regulation on the share of shipping alliance of Japan and Indonesia, 40 % of the cargo is supposed to be carried by Indonesian side. Actually, however, Japanese and other countries' shipping companies carry the Indonesian share of cargo under the regulation due to the shortage of ships.

And, the navigation of the coastal shipping vessels of over 25 years old is prohibited by the Government Regulation No.4 / 1985 that aimed at the promotion of the shipbuilding industry and the improvement of the vessels. But, the President Order caused the decrease of the number of vessels because the procurement of new ships was not enough. This President Order confused an Indonesian economy as a result.

Like this, shipping policies of Indonesian didn't necessarily work well. The latest shipping policies in Indonesia are as follows.

Government Regulation No.18 / 1982

- Reservation of the Government cargo
- Government Regulation No.4 / 1985
- Freeing calls at ports of foreign vessels
- Prohibition of operating old vessels of over 25 years old
- Government Regulation No.21 / 1988
- Permission of domestic shipping by foreign vessel under a regular condition
- Easing restrictions regarding establishment of a shipping company
- Abolition of the prohibition of operating vessels of over 25 years old
- Easing restrictions regarding import of used small vessels Amendment of the Regulation / 1992
- Reinforcement of restrictions regarding establishment of shipping companies
- Reinforcement of restrictions regarding the introduction of foreign capital to domestic shipping

Amendment of the Regulation / 1994

- Easing restrictions regarding the introduction of foreign capital Government Regulation No.82 / 1999
- Reinforcement of restrictions regarding establishment of a shipping company
- Reinforcement of restrictions regarding establishment of a shipping agents
- Reinforcement of restrictions regarding shipping routes
- Easing restrictions regarding activities of shipping companies

2.5.3. Maritime Traffic Administrative System

Administration of the safety at sea is done jointly by Directorate General of Sea Communication, Ministry of Communications (DGSC). DGSC shares all of the related services in the supervision over its subordinate organizations. The responsibility assignment system of each department office of DGSC is as mentioned in the **Figure 1.5.3**. of **Chapter 1**.

2.5.4. Maritime Traffic Regulation

(1) The state of ratification of conventions

Among major conventions regarding safety of navigation and prevention of

maritime pollution that came into effect, the Government of Indonesia has ratified the following conventions and protocols and a part of amendments by the presidential order.

United Nations Convention on the Law of the Sea (UNCLOS)

International Convention for the Safety of Life at Sea,1974 (SOLAS 74) Protocol of 1978 relating to the International Convention for the Safety of Life at Sea,1974 (SOLAS PROT 78)

Convention on the International Regulations for Preventing Collisions at Sea, (COLREG 72) $\,$

International Convention on Load Lines, 1966 (LL66)

International Convention on Standards of Training, Certification and Watch-keeping for Seafarers , 1978 (STCW 78)

International Convention on Maritime Search and Rescue,1979 (SAR 79)

Protocol of 1973 relating to the International Convention for the Prevention of Pollution From ships , 1973(MARPOL PROT 73)

International Convention on Civil Liability for Oil Pollution Damage , 1969 (CLC 69)

International Convention on the Establishment of an International Fund for compensation for Oil Pollution Damage , 1971 (FUND 71)

Convention on the International Maritime Satellite Organization (INMARSATC)

The International COSPAS-SARSAT Programme Agreement(COS-SAR 88)

(2) Domestic regulations regarding maritime traffic

Even after attaining independence following World War , Indonesian maritime laws continued to adhere to various laws applicable during Dutch rule.

Since considerable time has passed after the institution of these laws, and since they have not met actual situations, they are no longer realistically applicable to all maritime-related matters. Accordingly, although such higher-level laws continue to exist, actual operations are conducted according to lower-level rules, which remain applicable. However, those lower-level rules and regulations were passed in the form of ad hoc "administrative guidance", such as Presidential Orders, Ministerial Orders, General Bureau of Shipping Notifications, and Harbormaster Notifications.

Because the maritime-related laws and orders had not been systematized, a new Law Number 21, "Navigation Act," was passed in 1992, integrating all

of these.

This Navigation Act generally covers laws regarding ship registration, ship safety, maritime traffic safety, ports and harbors, mariners, ships' officers, marine transportation, etc. It is a basic law, covering all maritime transportation and maritime traffic.

The Navigation Act only stipulates basic matters and concepts, whereas the actual and practical regulations are determined through ordinances.

Up until now, Government Regulation No.70/1996 regarding port and harbor and Government Regulation No.82/1999 regarding transportation on water has been in effect.

As for regulations concerning vessel navigation methods and hazardous substances, etc., there are domestic rules, in the form of various notifications, in effect for each port concerning the loading, unloading, handling and transport of hazardous materials on ships; maritime construction and engineering work; and other aspect of navigation safety (piloting, ship inspection, etc.).

2.6. Fishery

2.6.1. General Data of Fishery

Indonesia is endowed with vast fishery resources both in the coastal waters and in the offshore waters including the Indonesian Exclusive Economic Zone. (IEEZ).

The size of fishery waters in Indonesia is shown in **Table 2.6.1**.

	i j materis in indonesia
Item	Figure of the Size
Land Area:	1.91 million square km
Territorial Waters:	3.17 million square km
Shelf Area (to 200m depth)	2.713 million square km
IEEZ area including Territorial Waters:	5.883 million square km
Length of Coastline:	81,000 km

Table 2.6.1. Size of Fishery Waters in Indonesia

2.6.2. Organization of Fishery Industry in GOI

Up to 1999, fishery industry had been managed by the Directorate General of Fisheries of the Ministry of Agriculture.

The Ministry of Sea Exploration was established based on the Presidential Decree No.355/M of 1999. This ministry shortly became the Ministry of Sea Exploration and Fisheries according to the Presidential Decree Number 147 of 1999. After the cabinet change following the Annual Session of the People's Consultative Assembly in 2000, the Ministry of Sea Exploration and Fisheries became the Ministry of Marine Affairs and Fisheries under the Presidential Decree Number 165 of 2000 and it is existing as of March 2002.

The organization chart is shown in **Figure 2.6.1**.

2.6.3. Fishery Production

(1) Number of Fishermen

The total number of fishermen was about 4.5 million in year 1998. About a half of the number was the fishermen engaged in marine fishery and the rest was for inland fisheries including fish culture. The changes of sub-sector-wise number of fisherman are shown in **Table 2.6.2**.

0						
Sub-sector	1990	1994	1995	1996	1997	1998
Fishermen	1,994,414	2,315,787	2,463,237	2,538,954	2,596,428	2,729,341
- Marine Fishermen	1,523,472	1,850,244	1,957,678	2,055,034	2,087,802	2,274,629
- Open-water Fishermen	4709,942	465,543	505,559	483,920	508,626	454,712
Fish Farmer	1,622,296	2,064,119	2,104,822	2,129,528	2,052,725	1,805,470
- Brackish-water Pond Culture	150,627	205,462	212,196	223,360	223,878	243,630
- Freshwater Pond Culture	1,119,050	1,388,779	1,388,710	1,396,299	1,343,607	1,251,071
- Cage Culture	11,111	29,731	44,804	39,425	49,975	53,436
- Paddy Field Culture	341,508	440,147	459,112	470,444	435,265	257,333
Total	3 616 710	4 370 006	4 568 050	4 668 482	1 640 153	4 534 811

Table 2.6.2. Changes of Sub-sector-wise Number of Fishermen

Source: Fishery Statistics of Indonesia 1998 (2000 Edition)



Figure 2.6.1. Organization Structure of the Ministry of Marine Affairs and Fisheries

(2) Marine Fisheries

Indonesian marine fisheries are very complex and diverse, reflecting the country's geographic characteristics and great variations in species and population densities.

The western part of Indonesian archipelago includes the relatively shallow Sunda Shelf area, which is bounded on the east roughly by Makassar and Bali Straits, and includes the large islands of Sumatra, Java and Kalimantan. These waters, which are relatively rich, produce about two-thirds of the total fish catch and attract large amounts of fishing efforts, particularly in the areas relatively close to shore. The quantities of fish production by province in 1999 are shown in **Table 2.6.3**.

Except for the shelf area between Irian Jaya and Australia, i.e., Arafura Sea of the Sahul Shelf, deep waters mark the eastern part of the archipelago. In the Arafra Sea, there is commercial fishing for shrimps, while outside this area, there are large-scale operations focused on tuna and skipjack fisheries. Total production of marine fisheries was 1,081.6 thousand tons in 1976 and 4,076.0 thousand tons in 1999 as shown in **Table 2.6.4**.

Total fishing boats of marine fisheries numbered 459,894 in 1999 and more than 50 percent of the fleet were non-powered boats (53.8percent) as shown in **Table 2.6.5**. Among the powered boats, 55.76 percent of them used outboard engines and were typically small-sized boats of less than 5 GRT. Most of the non-powered boats were dugout canoes, ranging from 3 to 10 meters in length and generally operated by three to five fishers, using a wide variety of gear, including fill-nets, cast nets, traps, seines and hook-and-line. Their fishing grounds are in the waters close to their home base in a daily trip.

Fishing households involved in the marine capture fisheries numbered 453,104 in 1998 and 483,792 in 1999 (6.8 percent up compared to 1998) as shown in **Table 2.6.6.** A big part of the fishing households was Sulawesi (24.29 percent), followed by Sumatra (23.98 percent), Jawa (18.35 percent), and Bali & Nusa Tenggara (12.23 percent) in 1999.

(3) Inland Fisheries and Aquaculture

Almost all of the products from open water capture fishery (321,962 tons) in 1999 was fin-fish of various species (over 90 percent). Most came from Kalimantan (44.6 percent), Sumatra (27.9 percent), Java (15.6 percent) and Sulawesi (9.6 percent). The biggest product of region-wise aquaculture is Jawa (52.7 percent), followed by Sulawesi (23.1 percent), Sumatra (18.3 percent), and Kalimantan (4.0 percent). Those figures are shown in **Table 2.6.3**.

Inland and culture fisheries produced 401.3 thousand tons in 1976 and 1,041.4 thousand tons in 2000, 744.1 thousand tons from aquaculture and 297.3 tons from capture. Blackish water cultivation produced 360.8 thousand tons, freshwater pond produced 185.2 thousand tons, paddy field culture produced 100.8 thousand tons, and cage culture produced 97.3 thousand tons. Those figures are shown in **Table 2.6.4**.

A total of 120,592 fishing boats were employed for open water fisheries in 1999. Most of them were non-powered (90.0 percent), while the rest were powered boats, mostly with outboard engine (94.4 percent). These figures are shown in **Table 2.6.5**. A variety of fishing gears were used in the fishery, namely handlines, set gillnets, longlines, scoop nets, drift gillnets, etc.

Fishing households involved in the inland fisheries numbered 1,363,591 in 1998 and 1,605,044 in 1999 (17.7 percent up compared to 1998) as shown in **Table 2.6.6.** A big part of the fishing households was Jawa (65.16 percent), followed by Sumatra (19.45 percent), Kalimantan (5.67 percent), and Sulawesi (5.31 percent) in 1999.

Description			Marine Sub total		total	Open Sub Total		Total	Brackish		Fresh Water		Cage		Paddy			
	1,998	1,999	1,998	1,999	1,998	1,999	1,998	1,999	1,998	1,999	1,998	1,999	1,998	1,999	1,998	1,999	1,998	1,999
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Dista Aceh	142,705	135,781	124,958	109,871	17,747	25,910	1,087	925	16,660	24,985	13,975	20,967	1,654	1,190	49	66	982	2,762
Sumatera Utara	358,329	353,470	321,793	314,356	36,536	39,114	6,979	7,060	29,557	32,054	14,217	15,170	7,433	8,044	1,489	1,786	6,418	7,054
Sumatera Barat	125,220	117,476	101,563	91,836	23,657	25,640	6,651	7,003	17,006	18,637	-	-	13,263	14,334	1,512	1,814	2,231	2,489
Riau	259,113	275,451	239,828	256,215	19,285	19,236	12,488	12,578	6,797	6,658	208	297	3,093	5,500	540	847	2,956	14
Jambi	40,960	44,901	32,969	35,889	7,991	9,012	5,287	5,882	2,704	3,130	400	784	1,399	1,342	889	987	16	17
SumateraSelatan	205,813	218,421	140,599	146,933	65,214	71,488	45,523	46,293	19,691	25,195	5,210	6,495	11,805	15,059	378	984	2,298	2,657
Bengkulu	27,908	33,831	20,400	24,754	7,508	9,077	3,359	3,893	4,149	5,184	437	657	1,992	2,497	28	50	1,692	1,980
Lampung	137,497	198,608	96,553	166,427	40,944	32,181	6,078	6,135	34,866	26,046	31,156	22,592	2,853	2,920	207	55	650	479
Sumatera	1,297,545	1,377,939	1,078,663	1,146,281	218,882	231,658	87,452	89,769	131,430	141,889	65,603	66,962	43,492	50,886	5,092	6,589	17,243	17,452
D.K.I.Jakarta	76,612	95,710	75,635	94,724	977	986	-	-	977	986	-	-	977	986	-	-	-	-
Jawa Barat	354,820	406,999	173,362	163,866	181,458	243,133	6,400	11,803	175,058	231,330	63,494	63,451	74,768	91,917	3,592	26,605	33,204	49,357
Jawa Tengah	382,434	340,000	306,413	262,165	76,021	77,835	19,408	21,222	56,613	56,613	35,654	35,654	15,588	15,588	3,261	3,261	2,110	2,110
D.I.Yogyakarta	5,580	6,688	1,184	1,250	4,396	5,438	1,377	1,444	3,019	3,994	-	-	2,555	3,509	168	173	296	312
Jawa Timur	420,418	424,858	278,670	292,982	141,748	131,876	14,248	15,737	127,500	116,139	74,483	62,641	18,462	14,023	1,261	1,454	33,294	38,021
Jawa	1,239,864	1,274,255	835,264	814,987	404,600	459,268	41,433	50,206	363,167	409,062	173,631	161,746	112,350	126,023	8,282	31,493	68,904	89,800
Bali	82,187	53,668	78,992	50,660	3,195	3,008	1,161	1,166	2,034	1,842	1,104	881	517	525	9	24	404	412
Nusa Tenggara Barat	85,379	90,778	73,294	78,441	12,085	12,337	2,834	3,031	9,251	9,306	7,162	6,954	1,296	1,400	19	50	774	902
Nusa Tenggara Timur	176,137	176,769	175,276	175,276	861	1,493	426	445	435	1,048	176	785	245	243	-	-	14	20
Bali,Nusra,&Tim-Tim	343,703	321,215	327,562	304,377	16,141	16,838	4,421	4,642	11,720	12,196	8,442	8,620	2,058	2,168	28	74	1,192	1,334
Kalimantan Barat	83,493	73,463	69,518	59,042	13,975	14,421	10,969	11,639	3,006	2,782	1,442	1,198	1,051	1,095	511	488	2	1
Kalimantan Tengah	85,460	87,789	50,936	50,936	34,524	36,853	34,524	35,526	0	1,327	-	-	-	272	-	1,055	-	-
Kalimantan Selatan	154,704	154,512	94,964	90,364	59,740	64,148	56,494	59,910	3,246	4,238	1,508	2,238	467	564	1,177	1,327	94	109
Kalimantan Timur	98,284	298,187	72,809	238,914	25,475	59,273	16,240	36,497	9,235	22,776	7,675	14,477	101	220	1,459	8,079	-	-
Kalimantan	421,941	613,951	288,227	439,256	133,714	174,695	118,227	143,572	15,487	31,123	10,625	17,913	1,619	2,151	3,147	10,949	96	110
Sulawesi Utara	164,497	170,166	160,823	160,823	3,674	9,343	528	2,871	3,146	6,472	149	171	1,557	2,715	881	1,649	559	1,937
Sulawesi Tengah	97,906	94,398	87,552	87,552	10,354	6,846	366	273	9,988	6,573	6,115	3,454	3,854	3,070	13	43	6	6
Sulawesi Selatan	373,604	458,933	264,730	278,390	108,874	180,543	25,570	23,596	83,304	156,947	79,738	152,746	1,639	1,992	-	-	1,927	2,209
Sulawesi Tenggara	179,405	170,314	161,895	157,012	17,510	13,302	7,974	4,126	9,536	9,176	8,846	8,653	685	493	2	14	3	16
Sulawesi	815,412	893,811	675,000	683,777	140,412	210,034	34,438	30,866	105,974	179,168	94,848	165,024	7,735	8,270	896	1,706	2,495	4,168
Maluku	361,432	361,257	361,111	361,111	321	146	113	9	208	137	204	135	4	2	-	-	-	-
Irian Jaya	162,312	184,879	157,919	179,763	4,393	5,116	2,582	2,898	1,811	2,218	397	422	1,220	1,453	194	343	-	-
Maluku & Irian Jaya	523,744	546,136	519,030	540,874	4,714	5,262	2,695	2,907	2,019	2,355	601	557	1,224	1,455	194	343	-	-
Indonesia	4,642,209	5,027,307	3,723,746	3,929,552	918,463	1,097,755	288,666	321,962	629,797	775,793	353,750	420,822	168,478	190,953	17,639	51,154	89,930	112,864

Table 2.6.3. Quantity of Fish Production by Province and Fishery Sub Sector (1998 & 1999)
Unit: 1,000 T	on		Perikanan Darat - Inland Fisheries									
							Budidaya - Fi	ish cultured				
Year	Total	Marine Fisheries	Sub Total	Open Water	Sub Total	Brackish Water Pond	Fresh Water Pond	Cage	Paddy Field			
(1)	(2) = (3)+(4)	(3)	(4) = (5)+(6)	(5)	(6)=(7)+(8)+(9)+(10)	(7)	(8)	(9)	(10)			
1976	1,482.9	1,081.6	401.3	246.7	154.6	80.2	52.6	0.4	21.4			
1977	1,571.8	1,157.7	414.1	254.2	159.9	87.6	54.3	0.3	17.7			
1978	1,647.7	1,227.4	420.3	249.2	171.1	88.0	57.7	0.4	25.0			
1979	1,748.4	1,317.7	430.7	248.2	182.5	93.6	59.4	0.4	29.1			
1980	1,849.7	1,394.8	454.9	254.5	200.4	97.9	66.4	0.6	35.5			
1981	1,914.5	1,408.3	506.2	265.0	241.2	112.9	78.2	0.6	49.5			
1982	1,997.5	1,490.7	506.8	265.3	241.5	129.3	69.2	0.9	42.1			
1983	2,214.6	1,682.0	532.6	265.6	267.0	134.1	79.7	1.0	52.2			
1984	2,261.0	1,712.8	548.2	269.3	278.9	142.4	76.5	1.1	58.9			
1985	2,395.5	1,821.7	573.8	269.3	304.5	156.4	84.2	0.7	63.2			
1986	2,529.9	1,922.8	607.1	273.0	334.1	170.3	88.7	0.6	74.5			
1987	2,670.5	2,017.4	653.1	276.3	376.8	192.1	95.4	1.9	87.4			
1988	2,881.2	2,169.6	711.6	281.3	430.3	233.3	104.2	3.6	89.2			
1989	3,035.3	2,272.2	763.1	296.4	466.7	258.5	113.7	4.9	89.6			
1990	3,162.5	2,370.1	792.4	292.5	499.9	287.1	120.6	4.5	87.7			
1991	3,349.6	2,537.6	812.0	294.5	517.5	323.2	106.9	6.6	80.8			
1992	3,543.4	2,692.1	851.3	300.9	550.4	337.5	116.7	8.8	87.4			
1993	3,795.3	2,886.3	909.0	308.6	600.4	355.3	141.9	26.0	77.2			
1994	4,013.8	3,080.2	933.6	336.1	597.5	346.2	140.1	33.0	78.2			
1995	4,263.6	3,292.9	970.7	329.7	641.0	361.2	162.2	39.9	77.7			
1996	4,452.2	3,383.5	1,068.7	335.7	733.0	404.3	182.9	44.6	101.2			
1997	4,579.9	3,613.0	966.9	304.3	662.6	370.3	171.8	26.2	94.3			
1998	4,465.9	3,489.8	976.1	298.6	677.5	350.0	170.8	60.0	96.7			
1999	4,970.0	3,950.0	1,020.0	308.0	712.0	400.0	185.0	30.0	97.0			
2000	5,117.4	4,076.0	1,041.4	297.3	744.1	360.8	185.2	97.3	100.8			

Table 2.6.4. Quantity of Fish Production by Sub Sector (1976 - 2000)

Source: Statistik Indonesia 2000 (Statistical Year Book of Indonesia)

Table 2.6.5. Number of Fishing Boats by Province and Type of Boat (1998 & 1999)

			Tota			Marine Fisheries				Open Water Fishries			r Fishries					
D	Non Po	wered	Out H	Board	In B	oard	Non P	owered	Out H	Board	In B	oard	Non Po	wered	Out I	Board	In B	oard
Description	Bo	at	Motor	Boat	Motor	Boat	Bo	bat	Motor	Boat	Motor	Boat	Motor	Boat	Motor	Boat	Motor	Boat
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Dista Aceh	7.160	8.012	4.213	4.475	4.111	3.599	6.161	6.813	3.911	4.173	4.107	3.595	999	1.199	302	302	4	4
Sumatera Utara	15.635	19.622	708	754	14.809	15.676	11.019	12.791	708	754	14.809	15.676	4.616	6.831	-	-	-	-
Sumatera Barat	8.322	7.827	1.854	1.799	1.291	1.397	4.334	4.388	1.754	1.736	1.291	1.397	3.988	3.439	100	63	-	
Riau	33.982	31.452	2.372	1.083	15.992	18.361	16.988	16.988	2.225	936	15.992	18.361	16.994	14.464	147	147	-	-
Jambi	8,772	6,958	183	213	1,813	1,900	331	356	37	40	1,813	1,900	8,441	6,602	146	173	-	-
SumateraSelatan	30.435	18.759	4.530	5.630	6.748	6.258	3.437	2.715	4.530	5.630	6.748	6.258	26.998	16.044	-	-	-	
Bengkulu	1.090	1.777	474	547	394	581	892	1.564	474	547	394	581	198	213	-	-	-	-
Lampung	7.689	6.376	1.258	2.372	1.557	3.728	2.375	4.730	1.181	2.310	1.557	3.728	5.314	1.646	77	62	-	
Sumatera	113.085	100.783	15,592	16.873	46.715	51,500	45,537	50.345	14,820	16,126	46.711	51,496	67.548	50,438	772	747	4	4
D.K.I.Jakarta	309	1,210	659	1,325	2,108	1,639	309	1,210	659	1,325	2,108	1,639			-	-	-	-
Jawa Barat	2,596	2,230	10,789	19,371	2,074	1,905	1,245	1,211	10,789	19,371	2,074	1,905	1,351	1,019	-	-	-	-
Jawa Tengah	4.299	4.299	14.077	14.077	1.393	1.393	1.577	1.577	13.983	13.983	1.393	1.393	2.722	2.722	94	94	-	
D.I.Yogyakarta	6	0	138	166	38	2	6		138	166	38	2			-	-	-	-
Jawa Timur	15.263	16.441	20.610	27.648	4.548	6.494	11.183	12.317	20.610	27.611	4.548	6.494	4.080	4.124	-	37	-	-
Jawa	22,473	24.180	46.273	62,587	10.161	11.433	14.320	16,315	46,179	62,456	10,161	11.433	8.153	7.865	94	131	0	0
Bali	7.263	6.079	6.010	6.151	676	571	6.882	5.616	6.010	6.151	676	571	381	463	-	-	-	-
Nusa Tenggara Barat	10.078	9.716	4.057	3.798	1.561	1.680	9.816	9.431	4.057	3.798	1.561	1.680	262	285	-	-	-	-
Nusa Tenggara Timur	8,255	15,247	362	793	882	1,512	8,249	15,227	362	793	882	1,512	6	20	-	-	-	-
Bali.Nusra.&Tim-Tim	25.596	31.042	10.429	10.742	3.119	3.763	24,947	30,274	10,429	10.742	3,119	3.763	649	768	0	0	0	0
Kalimantan Barat	7.300	7.327	4.166	3.694	1.803	1.923	2.899	2.568	1.981	1.517	1.803	1.923	4.401	4.759	2.185	2.177	-	
Kalimantan Tengah	9.108	9.108	0	175	3.712	3.712	1.588	1.588			3.039	3.039	7.520	7.520	-	175	673	673
Kalimantan Selatan	21.131	21.200	459	460	5.035	5.454	1.417	1.446	459	460	5.035	5.454	19.714	19.754	-	-	-	
Kalimantan Timur	8,615	8,615	9,971	9,971	7,114	7,114	2,343	2,343	3,867	3,867	7,114	7,114	6,272	6,272	6,104	6,104	-	-
Kalimantan	46,154	46,250	14,596	14,300	17,664	18,203	8,247	7,945	6,307	5,844	16,991	17,530	37,907	38,305	8,289	8,456	673	673
Sulawesi Utara	23.230	30.482	5.409	5.172	914	636	21.727	28.979	5.404	5.167	914	636	1.503	1.503	5	5	-	-
Sulawesi Tengah	20.538	20.538	2.755	2.755	1.272	1.272	20.320	20.320	2.751	2.751	1.272	1.272	218	218	4	4	-	-
Sulawesi Selatan	20.857	26.183	8.003	6.880	3.988	3.531	18.892	23.776	6.348	5.264	3.988	3.531	1.965	2.407	1.655	1.616	-	-
Sulawesi Tenggara	14.877	14.977	4.226	4.366	895	932	13.957	14.021	4.156	4.276	895	932	920	956	70	90	-	
Sulawesi	79,502	92,180	20,393	19,173	7,069	6,371	74,896	87,096	18,659	17,458	7,069	6,371	4,606	5,084	1,734	1,715	0	0
	33,041	33,085	2,396	2,457	1,2/3	1,455	32,960	33,004	2,396	2,457	1,2/3	1,455	5 0 40	18	- 001	-	-	-
Irian Java	28.526	28.528	3.616	3.656	1.763	1.925	22.583	22.488	3.335	3.3/1	1.763	1.925	5.943	6.040	281	285	-	
Maluku & Irian Jaya	61,567	61,613	6,012	6,113	3,036	3,380	55.543	55.492	5.731	5.828	3.036	3.380	6.024	6.121	281	285	0	0
Indonesia	348,377	356,048	113,295	129,788	87,764	94,650	223,490	247,467	102,125	118,454	87,087	93,973	124,887	108,581	11,170	11,334	677	677
							54.2% 53.8% 24.7% 25.8% 21.1% 20.4%				91.3% 90.0% 8.2% 9.4%			0.5%	0.6%			
				Grand Total 1998 412,702			Grand Total 1998			136,	/ 34							
Source: Statistik Indonesia 2000 (Statistical Year Book of Indonesia)					Grand Total 1999				459,894			Grand Total 1999			120,	592		

		Perikanan darat - Inland fisheries																
												Buc	lidava - Fis	h culture				
			Douil	ionon														
Deventored	T		Perin		C. I. I		Damata		C. I. I		Tam	ıbak	V -1		V	h.e	G	
Provinsi	Jui		La	iut	Subj		Peralia	in umum	Subj		Brac	kish		am	Kara	iniba		
Province	10	otal	Ma	rine	Sub	total	Oper	water	Sub	total	water	pond	Fresh	water	Ca	ge	Paddy	/ field
	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
(1)	(2)	(2)	(4)	(5)	(6)	(7)	(0)	(0)	(10)	(11)	(19)	(12)	(1.4)	(15)	(16)	(17)	(19)	(10)
Dista Aceh	40 228	41 920	14 800	15 712	25 428	26 208	1 753	1 957	23 675	24 251	17 368	18 385	3 858	4 820	34	34	2 415	1 012
Sumatera Utara	76 747	79 028	26 883	29 853	49 864	49 175	11 157	12 260	38 707	36 915	3 435	1 699	12 667	11 049	3 1 1 3	4 214	19 492	19 953
Sumatera Barat	79.068	81.697	7.236	6.814	71.832	74,883	25,281	24,598	46.551	50,285	0	0	41.554	45.240	1.078	649	3.919	4.396
Riau	58,298	59.254	34.299	29.176	23.999	30.078	16.235	16.062	7.764	14.016	323	323	5.873	9.329	442	4.364	1.126	0
Jambi	23.509	23.070	2.095	2.120	21.414	20.950	9.351	8.084	12.063	12.866	173	319	9.858	10.078	2.002	2.363	30	106
SumateraSelatan	65.211	64.603	14.694	14.467	50.517	50.136	29.076	29.136	21.441	21.000	2.770	2.942	10.588	11.595	702	811	7.381	5.652
Bengkulu	13.150	17.608	3.166	4.762	9.984	12.846	3.558	6.133	6.426	6.713	48	46	2.604	2.457	2.046	3.050	1.728	1.160
Lampung	51.606	60.994	6.226	13.113	45.380	47.881	8.371	8.371	37.009	39.510	17.250	17.488	13.449	14.832	150	300	6.160	6.890
Sumatera	407.817	428,174	109,399	116,017	298,418	312,157	104,782	106,601	193,636	205,556	41,367	41,202	100,451	109,400	9,567	15,785	42,251	39,169
D.K.I.Jakarta	9.430	6.121	5.852	3.712	3.578	2.409	0	0	3.578	2.409	0	0	3.578	2.409	0	0	0	0
.Jawa Barat	367.235	597.680	15.098	22.647	352.137	575.033	25.132	44.980	327.005	530.053	12.107	51.218	301.193	328.379	632	4.675	13.073	145.781
.Jawa Tengah	287.527	287.527	16.327	16.327	271.200	271.200	45.669	45.669	225.531	225.531	20.748	20.748	179.861	179.861	720	720	24.202	24.202
	50.000	00.410	0.011	0 700	50.400	00.001	0.007	14.000	44.505	40 505	0	0	00 700	40.000	000	000	10.100	7.004
D.I. Yogvakarta	59.633	69.410	6.211	<u>b./29</u> 20.209	120 050	62.681	<u>8.827</u>	14.086	44.595	48.595	10 200	10 05 9	33.766	40.338	690	633	10.139	<u>7.624</u>
Jawa Hiliui Jawa	904 991	1 134 601	85 006	88 813	<u> </u>	1 0/5 878	108 / 20	134 897	710.037	Q11 051	19.290 59 145	10.0J2 90 818	581 542	611 866	9 01 3	6 9 9 8	74 165	201 430
Bali	30 208	30 715	15 320	14 456	23 870	25 250	6 976	8 0/0	16 903	17 210	110	121	6 605	6 777	26	72	10.072	10 2/0
Nusa Tenggara Barat	40.051	32,967	16 328	16 258	23 723	16 709	8 912	2 524	14 811	14 185	2 459	4 430	6.033	5 369	20	/2 0	5 415	4 386
Nusa Tenggara Timur	28 563	36 002	18 677	28 4 38	9 886	7 564	1 626	1 741	8 260	5 823	282	297	7 016	4 672	0	0	962	854
Bali.Nusra.&Tim-Tim	107.822	108.684	50.334	59.152	57.488	49.532	17.514	12.305	39.974	37.227	2.851	4.848	20.648	16.818	26	72	16.449	15.489
Kalimantan Barat	16,967	15,975	6,272	5,568	10,695	10,407	4,471	4,487	6,224	5,920	365	370	5,022	4,708	813	832	24	10
Kalimantan Tengah	13.164	20.664	4.709	4.554	8.455	16.110	8.455	8.553	0	7.557	0	0	0	2.919	0	4.638	0	0
Kalimantan Selatan	35.894	36.068	6.705	6.832	29.189	29.236	23.039	23.007	6.150	6.229	1.220	1.222	2.235	2.231	2.452	2.294	243	482
Kalimantan Timur	47,237	47,653	12,397	12,397	34,840	35,256	12,497	12,497	22,343	22,759	6,308	7,259	1,365	1,365	14,670	14,135	0	0
Kalimantan	113.262	120.360	30.083	29.351	83.179	91.009	48.462	48.544	34.717	42.465	7.893	8.851	8.622	11.223	17.935	21.899	267	492
Sulawesi Utara	51,305	61,642	33,907	43,311	17,398	18,331	2,332	2,337	15,066	15,994	378	382	6,397	6,432	747	1,348	7,544	7,832
Sulawesi Tengah	27.149	28.222	23.227	23.227	3.922	4.995	480	480	3.442	4.515	1.785	2.652	1.596	1.823	12	15	49	25
Sulawesi Selatan	81.111	83.392	27.652	31.270	53.459	52.122	6.865	6.525	46.594	45.597	32.890	31.940	3.108	3.146	0	0	10.596	10.511
Sulawesi Tenggara	29,324	29,415	19,552	19,707	9,772	9,708	2,967	2,967	6,805	6,741	4,546	4,477	2,178	2,177	29	35	52	52
Sulawesi		202.671	104.338	117.515	84.551	85.156	12.644	12.309	71.907	72.847	39.599	39.451	13.279	13.578	788	1.398	18.241	18.420
Maluku	37.665	37.645	37.290	37.290	375	355	203	203	172	152	12	12	160	140	0	0	0	0
Irian Java Mahalara 8 Intern I	56.949	56.611	36.564	35.654	20.385	20.957	8.417	8.889	11.968	12.068	544	546	11.219	11.314	205	208	0	0
Maluku & Irian Java		94.256	/3.854	72.944	20.760		8.620	9.092		1 991 999	556	105 700	795 000	774 220	205	208	151 979	975 000
muonesia	1,910,095	£,Uðð,ð36	435,104	485,792	1,303,391	1,000,044	300,431	525,078	1,003,140	1,201,300	144,411	192,128	133,922	//4,339	51,434	40,290	131,3/3	£/3,009

Table 2.6.6. Number of Fishing Households by Province and Fishery Sub Sector

Source: Source :Direktorat Jenderal Perikanan/Directorat General of Fisheries

(4) Utilization of Fish Production

58.4 percent of fish production is consumed as fresh fish. There are, however, severe limits to the supply of ice and refrigerated storage and transport facilities, so most of the balance of the catch is processed and consumed as dried and salted (22.7 percent) and smoked, boiled or fermented. There are about 8,000 small fish processing operations, generally using traditional methods. **Table 2.6.7**. shows the amount of fish production excluding culture fish.

Detail	Sea	%	Inlandwater	%	Total	%
Fresh Fish	2,091,261	56.2	252,825	87.6	2,344,086	58.4
Canned	331,139	8.9	5,514	0.5	332,653	8.3
Frozen	53,434	1.4	20	0.0	53,454	1.3
Salted/dried	882,677	23.7	29,663	10.3	912,340	22.7
Boiled	151,799	4.1	461	0.2	152,260	3.8
Fermented	63,715	1.7	214	0.1	63,929	1.6
Smoked	66,982	1.8	2,947	1.0	69,929	1.7
Fish meal	44,094	1.2	23	0.0	44,117	1.1
Other	38,645	1.0	999	0.3	39,644	1.0
Total	3,723,746	100	288,666	100	4,012,412	100

Source: Fishery Statistics of Indonesia 1998 (2000 Edition)

unit: tons

2.6.4. State of Fishery Industry

The fisheries of western part of the country in general differ from those of the eastern part. In the west, the fisheries take place in the relatively shallow and fertile waters of the Sunda Shelf, in a region where large populations create a high demand and there are many fishermen.

The shrimp stocks provide one of the most valuable resources in this area. Trawling for shrimp began in the late 1960s, and increased rapidly in the following years. However, the trawlers operated in inshore waters where they damaged the gear of the small-scale fishermen and took large amounts of other fish, which were of value to small-scale fishermen. Conflict between the trawlers and small-scale fishermen led to a total ban on trawling except in parts of the eastern area of the country, where trawling is permitted provided the nets are equipped with by-catch excluder devices. Thus, except for growing amount of purse seine fisheries for small archipelagoes in the Java Sea and Malacca Strait and a small amount of tuna fishing in the Indian Ocean, the western part of the country is dominated by small-scale fisheries.

To overcome the problems of resources depletion and overcrowding in fisher communities, development of marine fisheries is directed to potential waters in the eastern part of the country and the EEZ, shifting jobs to marine culture, brackish-water culture or fish processing and enhancing of artificial reef development. Other efforts are through promotion of fisher transmigration.

2.7. Marine Casualties

2.7.1. Marine Casualty Statistics

Marine Casualty Statistics from April 1982 to December 2000 are shown in **Table 2.7.1.** According to the statistics, 3,826 cases of marine casualties occured during 18 years and 8 months. The average number of casualties per year is 204.1. The most frequent type of casualties is "Sunken" and the average per year is 87.1. It accounts for 42.7 percent of total casualties.

Number of human loss is listed from April 1992 to year 2000. A total of 3,038 of human lives were lost during 8 years and 8 months and the average per year is 347.

Vessels are divided into three groups by gross tonnage; vessels less than 35GT, from 35GT to 75GT, and over 75GT. Their percentages of total vessels are respectively 30.8, 33.8 and 35.4 percent.

2.7.2. Daily Marine Casualty Data

(1) Marine Casualty Data summarized by DGSC

DGSC has been historically collecting marine casualty data through regional offices. The data are summarized in itemized data such as date, time, location, position in latitude & longitude, gross ton, kind of ship, flag and victims. The data from 1994 to 2000 are shown in **Appendix 2.7.1**. There are many blank columns in the list, especially in the position column.

(2) Marine Casualty Data picked up from Newspapers

The Study Team collected the marine casualty data through scraps of various newspapers and magazines. The result of the summarized data from 1990 to May 2001 is shown in **Appendix 2.7.2**.

(3) Verification of DGSC's Marine Casualty Data

The Study Team verified DGSC's marine casualty data shown in Appendix 2.7.1. by utilizing the newspaper's scrap data shown in Appendix 2.7.2. from year 1994 to 2000. The result of the verification is shown in Appendix 2.7.3. for year 1994, Appendix 2.7.4. for 1995, Appendix 2.7.5. for 1996, Appendix 2.7.6. for 1997, Appendix 2.7.7. for 1998, Appendix 2.7.8. for 1999 and Appendix 2.7.9. for 2000. The patterned data in the Appendices show the data that are unlisted in the DGSC's.

The result of the verification is summarized in **Table 2.7.2.** This table shows that the average number of the unlisted accidents is 16.4 per year and dead / missing persons is 179.1 per year during 7 years from 1994 to 2000.

Table 2.7.1. Marine Casualty Statistic from April 1982 to December 2000

١o.	Casualties	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997	1998	1999	2000	Total	Per Year
1.	Type of Casualty																(Apr-Dec)					
	Sunken	171	121	138	158	107	107	120	101	79	82	75	65	62	54	40	43	42	41	27	1,633	87.1
	Fire	15	5	12	4	9	7	7	2	15	6	12	3	13	21	16	5	11	17	8	188	10.0
	Collision	37	26	30	14	19	24	12	24	23	17	23	14	30	21	18	15	16	9	3	375	20.0
	Engine Trouble	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	1	1	8	2.1
	Aground	47	37	34	30	23	26	30	24	29	30	25	24	26	13	12	12	13	19	9	463	24.7
	To Float	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	2	0.5
	Leakage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	3	3	12	3.2
	Other	98	117	109	141	115	68	94	86	76	63	47	27	24	22	22	5	10	9	12	1,145	61.1
	Total	368	306	323	347	273	232	263	237	222	198	182	133	155	131	108	82	103	99	64	3,826	204.1
2.	Looses																(Apr-Dec)					
	Human Looses	-	-	-	-	-	-	-	-	-	-	147	139	206	611	120	166	151	841	657	3,038	347
	Cargo Looses	-	-	-	-	-	-	-	-	-	-	17300	17100	14800	43000	9800	18809	2688	4027	17024	144,548	16520
	Car Looses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	3	-	18	5
	Animal Looses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	204	560	800	200
3.	Flag																(Jan-Dec)					
	Indonesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	99	98	55	335	84
	Foreign	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	5	10	17	51	13
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	102	104	108	72	386	97
4.	Gross Tonnage																(Apr-Dec)					
	< 100M3 (<35 GT.)	99	77	94	137	93	85	112	92	90	85	80	60	55	44	30	18	27	13	10	1,301	69.4
	100M3 - 500M3	180	155	158	129	112	99	86	88	82	60	64	40	43	60	37	10	6	15	4	1,428	76.2
	(35GT - 75GT)																					
	> 500m3 (> 75 GT.)	95	99	83	91	77	72	90	82	89	86	78	52	85	58	74	74	71	80	58	1,494	79.7
	Total	374	331	335	357	282	256	288	262	261	231	222	152	183	162	141	102	104	108	72	4,223	225.2
5.	Type of Vessel																(Apr-Dec)					
	Motor Ship	230	208	191	211	195	193	201	177	187	160	171	120	125	126	109	70	81	78	62	2,895	154.4
	Motorized Sail Boat	106	108	111	106	59	50	53	51	34	40	34	22	40	27	11	12	13	23	4	904	48.2
	Sail Boat	30	11	28	30	17	6	17	15	18	16	4	3	8	0	6	11	5	2	1	228	12.2
	Barge	8	4	5	10	11	7	17	19	22	15	13	7	10	9	14	11	5	5	5	197	10.5
\vdash																						
6.	Causes																(Apr-Dec)					
1	Human Error	163	100	123	114	55	75	84	81	91	86	92	63	71	51	53	33	44	40	25	1,444	77.0
	Force Major	116	106	110	146	111	112	117	125	91	68	44	38	49	46	39	44	25	38	25	1,450	77.3
	Hull Structure	89	100	90	87	107	45	62	31	40	44	46	32	35	34	16	5	34	21	14	932	49.7
	Total	368	306	323	347	273	232	263	237	222	198	182	133	155	131	108	82	103	99	64	3,826	

Source: Section of Ship Accidents, DGSC

						U			-
Unlisted in the DGSC's Marine Casualty Data	1994	1995	1996	1997	1998	1999	2000	Total	Average per Year
No. of Accident	15	11	22	18	16	16	17	115	16.4
No. of Dead	30	21	70	81	79	81	14	376	53.7
No. of Missing	70	95	389	45	93	114	72	878	125.4
Total of Dead / Missing	100	116	459	126	172	195	86	1254	179.1

Table 2.7.2. Number of Unlisted Marine Casualty Data in DGSC's Report

Source: JICA Study Team

(4) Marine Casualty Data supplemented by Maritime Court Decision Data As most of the marine casualty data provided by DGSC have no position data, the Study Team supplemented the blank position with Maritime Court Decision data if available. The re-summarized casualty data with accident position during year 1991 through 2000 are shown in Appendix 2.7.10.

2.7.3. Cause of Marine Casualties

The causes of the marine casualties have never been properly categorized in DGSC's report as shown in item No.6 "Causes" of **Table 2.7.1**. However, it is easy to estimate through newspapers or maritime court decisions that major passenger boat disasters were resulting from a lack of ship's stability due to overloading or old age in the rough sea. Recent major casualties mainly caused by less ship's stability are summarized in **Table 2.7.3**.

Table 2.7.3. Recent Major Casualties Caused by Less Stability

Cas	ualty Occurrence	Ship's Type	Cause of	Fatality Toll
Year/Month	Location		Casualty	including Missing
Jan.19, 1996	OffAceh	Ferry	Capsized	338
Jul. 12,1997	Off Batam Island	Passenger Ship	Capsized	14
Jul. 14,1997	Lake Toba	Passenger Ship	Capsized	83
Jul. 20,1997	Off Southern Sulawesi	Passenger Ship	Capsized	9
Jun.25,1998	Lombok Strait	Ferry	Sunken	78
Aug.17,1998	Off Cituis Fishery Port	Passenger Ship	Capsized	16
Nov.13,1998	Off Lambasina	Ferry	Capsized	21
Nov.15,1998	Makassar Strait	Craft Carrier	Capsized	Nil
Feb 6 1999	Off Tembelan Island	Wooden Sailboat	Sunkon	313

Source: DGSC, Maritime Court Decision

(1) Example of Maritime Court Decision

Wooden sailboat sunken on Feb. 6.1999

The sailboat left Sintete/Pemangkat Port for Apit River/Pekanbaru at 23:00 hours on Feb. 6, 1999. After 10 hours from the departure the weather condition was changed to strong wind of north. At the position of 8 miles from Mengirang Island, there was a leakage into engine room and sank at the position of 00 $^{\circ}$ 37' 20"N, 107 $^{\circ}$ 49' 59"E. The victims were 313

persons, all dead.

According to the Maritime Court Decision, the sinking was caused by unsatisfied hull construction thence water came into the engine room. The ship's particular is shown in **Table 2.7.4**.

Particular	Description	Particular	Description
Туре	Sailboat	Flag	Indonesia
Hull Material	Wooden	Gross Tonnage	148
Type of Engine	Diesel 120HP	Built Year	1991
Length Overall	22.46m		

Table 2.7.4. Particular of the Sunken Sail Boat

Ferry Boat sunken on November 13, 1998

The ferry boat left Bajoe Port for Kolaka on November 13, 1998 with 121 passengers / 14 crew members and 15 units of cars / 1 unit of motorcycle. After the departure the weather got worse and the deck was flooded by sea water, then she lost the stability and sank near the water of Tambelan Island at the position of 00 $^{\circ}$ 37' 20"N, 107 $^{\circ}$ 49' 59"E. The victims were 21 dead but others rescued.

According to the Maritime Court Decision, the sinking was caused by overloading of passengers and bad weather such as strong waves and winds. The ship's particular is shown in **Table 2.7.5**.

Particular	Description	Particular	Description
Туре	Ferry	Flag	Indonesia
Hull Material	Steel	Gross Tonnage	413
Type of Engine	Diesel	Built Year	1977 in Japan
	2 x 1,000 HP		
Length Overall	41.40m		

Table 2.7.5. Particular of the Sunken Ferry Boat

2.7.4. Outline of Major Casualties in 2000

(1) Sunken Ferry Boat over-carrying Passengers

The ferry Masnait which was carrying at least 130 passengers over the capacity of 62 passengers and 12 crew, sank off Ambon Island on May 7th 2000 en route from Hunimua in Ambon Island to Waipirit in Seram Island due to rough sea.

The sunken ferry was not seaworthy because it was designed to operate on lakes and rivers, and furthermore she was overloaded with passengers and cargoes. This casualty resulted in death of 41 passengers and 4 crew members.

(2) Sunken Ferry Boat carrying refugees fleeing sectarian violence in Tobelo A ferry boat named Cahaya Bahari carrying 476 refugees and 16 crews sank about 60 kilometers east of Siau Island in North Sulawesi on June 29th 2000 en route from Halmahera Island in North Maluku to Manado in North Sulawesi due to rough sea.

This disaster was caused by over-boarding of passengers exceeding the capacity of 270. The ferry boat lost her balance and capsized in the rough sea. 10 survivors were rescued but others were dead or still missing.

(3) Sunken Fishing Boat carrying passenger in Irian Jaya

A fishing boat, Nurul Fala, sank in the Port of Pomako Timika in Irian Jaya on July ^{‡t} 2000 due to overloading. At that time the fishing boat was carrying 30 passengers who had just disembarked from a passenger ship named Tatamailau after five day trip from Makassar. Most of the passengers were business persons who carried a lot of commodity purchased at Bugis, Makassar and Buton.

In the accident, six (6) survived but four (4) were killed and others were missing.

(4) Battered Sailing Boat carrying refugees from North Maluku District A sailing boat named Hasil Karya-2 was carrying 135 of refugees from North Maluk Distrikt to Tobotobo village to celebrate Lebaran on December 7th 2000. The sailing boat were battered by strong wave in the rough sea and sank.

In the accident, 19 were killed and others were missing.

2.7.5. Marine Casualty Statistics in the Straits of Malacca and Singapore (1) Number of Marine Casualties

During 25 years from 1977 to 2001 the number of marine casualties was 216. The average number per year was 8.64 and the top type of marine casualties was "Collision" numbering 114(52.8%), followed by "Grounding" with 66(30.6%) and "Sinking" with 19(8.8%) as shown in **Table 2.7.6**.

					5 51	``	,
Item	Collision	Grounding	Sinking	Fire	Explosion	Flooding	Total
Number	114	66	19	11	4	2	216
Percentage	52.8	30.6	8.8	5.1	1.9	0.9	100

Table 2.7.6. Number of Marine Casualties by Type (1977 ~2001)

Source: Casualty File by Lloyd's Maritime Information Services Limited (LMIS), JAMS

The yearly changes of marine casualties are shown in **Table 2.7.7**.

Voar	Collision	Grounding	Sinking	Fire	Evolosion	Flooding	Total	Dunlicating
1077	2	orounung	Sinking	rne	LAPIOSION	Tiouing	rotar 5	2 4 9 10 10 10
1977	3	~					J	
1978	3	Z					5	
1979	3	6	1				10	
1980	4	0	2(1)				6(1)	Collision, Sinking 1
1981	1	5	2	1			9	
1982	5	3		1(1)			9(1)	Collision, Fire 1
1983	2	3	1				6	
1984	4	3	1				8	
1985	4	2					6	
1986	3	1		1(1)			5(1)	Collision, Fire 1
1987	3	3			1		7	
1988	4	4				1	9	
1989	8	3	1				12	
1990	7	2		2			11	
1991	3	2					5	
1992	11	2	2(2)		2		17(2)	Collision, Sinking 2
1993	6	1					7	
1994	6	1	1				8	
1995	3	5	1	2(1)			11(1)	Collision, Fire 1
1996	5	4	2(1)				11(1)	Collision, Sinking 1
1997	10	3	1(1)	2	1	1	18(1)	Collision, Sinking 1
1998	5	3					8	
1999	2	2	1(1)	1			6(1)	Collision, Sinking 1
2000	4	2					6	
2001	5	2	3(2)	1			11(2)	Collision, Sinking 2
Total	114	66	19(8)	11(3)	4	2	216(11)	0

Table 2.7.7. Yearly Changes of Marine Casualties by Type (1977 ~2001)

Source: Casualty File by Lloyd's Maritime Information Services Limited (LMIS), JAMS Number in the brackets" ()" means duplicated number of vessel involved in the same casualty.

(2) Number of Vessel involved in Marine Casualty

During 25 years from 1977 to 2001 the number of the vessels involved in

marine casualties was 319.

The average number per year was 12.76 and the top type of the vessels involved was **"Tanker**" numbering 96(30.1%), followed by "General Cargo" with 42(13.2%) and "Dry Bulk" with 21(6.6%) as shown in **Table 2.7.8**

Table 2.7.8. Number of Vessels Involved in Marine Casualtiesby Ship's Type (1977 ~ 2001)

Item	Tanker	General Cargo	Dry Bulk	Chemical	Container	507/5NT	Fishing Boat	R0 / R0	Passenger	Others	Unknown	Total
Number	96	42	21	17	15	10	6	6	5	9	92	319
Percentage	30.1	13.2	6.6	5.3	4.7	3.1	1.9	1.9	1.6	2.8	28.8	100.0

Source: Casualty File by Lloyd's Maritime Information Services Limited (LMIS), JAMS

The yearly changes of the number of the vessels involved in marine casualty are shown in **Table 2.7.9**.

Table 2.7.9. Yearly Changes of Number of Vessels Involved in MarineCasualty by Ship's Type (1977 ~ 2001)

Year	Tanker	General Cargo	Dry Bulk	Chemical	Container	LNG /	Fishing Boat	R0 / R0	Passenger	Others	Unknown	Total
1977	5										3	8
1978	4					1					3	8
1979	5	3	1								3	13
1980	2	2					1				4	9
1981	2	2	1		2			1			1	10
1982	2	4	1					1			5	13
1983	2	3		1							2	8
1984		4	1	1		2					4	12
1985	1	4	1								4	10
1986	3	1		1		1					1	7
1987	4			1		1		1			3	10
1988	7	1				1					4	13
1989	3	4	1	1	1		1			1	8	20
1990	6	2	1	2							7	18
1991	3		1			1					3	8
1992	9		3		1		2		1		10	26
1993	4		1	1		1					6	13
1994	4	2			2						6	14
1995	7		1	1					1		3	13
1996	3	4		1	1	1			1		4	15

Continu	uation											
Year	Tanker	General Cargo	Dry Bulk	Chemical	Container	L 0 G /	Fishing Boat	R0 / R0	Passenger	Others	Unknown	Total
1997	10	4	2	1	2		1	1	1		5	27
1998	1	1	1	1	2		1	2	1	1	2	13
1999	3	1	2							1		7
2000	2		2	2	1	1				1	1	10
2001	4		1	3	3					3		14
Total	96	42	21	17	15	10	6	6	5	9	92	319

Source: Casualty File by Lloyd's Maritime Information Services Limited (LMIS), JAMS

The top range of ship's gross tonnage was " ~ 50,000" numbering 84(26.3%), followed by " ~ 5,000" with 41(12.9%) and " ~ 150,000" with 33(10.3%) as shown in **Table 2.7.10**.

Table 2.7.10. Number of Vessels Involved in Marine Casualtiesby Ship's Gross Tonnage (1977 ~ 2001)

Item	~1,000	~ 5,000	~ 10,000	~ 50,000	~ 100,000	~ 150,000	150,000 ~	Un known	Total
Number	28	41	29	84	28	33	1	75	319
Percentage	8.8%	12.9%	9.0%	26.3%	8.8%	10.3%	0.3%	23.5%	100%

Source: Casualty File by Lloyd's Maritime Information Services Limited (LMIS), JAMS

2.8. Piracy and Armed Robbery

2.8.1.Occurrence of Incident

According to the International Maritime Bureau (IMB),

(1) Worldwide situation

Worldwide reported piracy incidents in 2000 reached 469, recording the highest in the port. It showed an increase of 56% compared with 1999 figures and nearly four and half times more compared with 1991. The transition of a number of piracy incidents 1991 - 2000 is shown in **Figure 2.8.1**.





Indonesia recorded the highest number of attacks in the world and accounts for almost one quarter of the world's piratical attacks. Indonesia's political and economic situation is believed to be the main contributing factor to the alarming increase in attacks. The state of occurrence of piracy incidents by sea area in 2000 is shown in **Figure 2.8.2**.





Sea Area	Number
Indonesia	119
Malacca Strait	75
Bangladesh	55
India	35
Malaysia	21
The others	164
Total	469

Most attacks occurred while ships were at anchor and steaming. The condition of victim ships in 2000 is shown in **Figure 2.8.3**.



Figure 2.8.3. The Condition of Victim Ships in 2000

Violence had increased with more pirates being armed and more crewmembers injured. Those killed had risen to 72 in 2000 from 3 in 1999 and 26 crews are still missing. The transition of a number of the dead by piracy 1991 – 2000 is shown in **Figure 2.8.4**.

Figure 2.8.4. The Transition of a Number of the Dead by Piracy



Malacca Strait, one of the world's busiest shipping lane, which for many years had a relatively safe record, experienced 75 incidents in 2000 comparing with only two in 1999. It is now considered the second most dangerous piracy prone area following Indonesia. The transition of a number of piracy incidents by sea area 1999 – 2000 is shown in **Figure 2.8.5**.

Figure 2.8.5. The Transition of a Number of Piracy Incidents by Sea Area 1999 – 2000



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Indonesia	55	49	10	22	33	57	47	60	115	119
Malacca Strait	32	7	5	3	2	3	0	1	2	75
Bangladish	0	0	0	2	2	4	9	9	25	55
India	0	5	1	0	8	11	15	12	14	35
Malasia	1	2	0	4	5	5	4	10	18	21
Singapore Strait	0	0	0	3	2	2	5	1	14	5

(2) The condition of Indonesia

During the decade from 1991 to 2000, pirate incidents which appeared in the Indonesian sea area is changing. There were 60 cases until 1998, but the cases were rapidly increasing two years. There are 115 cases in 1999 and 119 cases in 2000.

Among 119 cases of pirate incidents which appeared in the Indonesian sea area in 2000, 88 cases were actual attacks and 31 cases were attempted attacks. And two hijacking incidents are included in the 88 cases of actual attacks. 63 % of actual attacks and 45 % of attempted attacks took place while at anchor.

Concerning killed crews or passengers by pirate incidents which appeared in the Indonesian sea area, there were 15 persons in 1998,but there were no person killed during two years in 1999 and 2000.

2.8.2. Enforcement of Measures

(1) Worldwide measure

Maritime Safety Committee (MSC) of International Maritime Organization (IMO) has considered the problem of piracy and armed robbery against ships in the committee since more than 10 years ago. And it published the circulars, for example, "Recommendation to Government for combating piracy and armed robbery against ships" (MSC/Circ.622), "Guidance to ship-owners and ship-operators, shipmasters and crews on preventing and suppressing acts of piracy and armed robbery against ships" (MSC/Circ.623) etc. Moreover IMO draw up "Code of practice for the investigation of the crimes of piracy and armed robbery against ships", and this Code was resolved at the General assembly in November 2001.

For the prevention of piracy and armed robbery against ship, the United Nations asks ratification of "Convention for the suppression of Unlawful acts Against the Safety of Maritime Navigation" (SUA Convention) and preparation of proper law system for the prosecution of piracy and armed robbery to all the countries in the Assembly held in May 2001. The UN recommended to the coastal countries, where piracies and armed robberies have been rampant, to plan urgent and proper counter measures against them.

After the M/V "ALONDRA RAINBOW" hijacking incident in 1999, which is a vessel related to Japan, Japan held various international pirate countermeasure conferences, and it is planning to strengthen the cooperation system among countries of the Asian area.

(3) Measure in Indonesia

Organization

a. Body of regulation

Concerning security on the sea, the navy coordinates the relating authorities, and responds to incidents. Also concerning the regulation of piracy and armed robbery against ships, the navy coordinates "the Coordinating Body for Security at sea" which consists of navy, marine and aviation police, GAMAT and customs, and takes necessary measures.

b. Contact point

National Rescue Agency (BASARNAS) of DGSC takes a charge of contact point based on the IMO recommendation concerning information of piracy. BASARNAS is the organization as the overall rescue coordination center in Indonesia for carrying out rescue on land, at sea, and in the air.

c. International contact point

GAMAT takes a charge of international contact point in Indonesia

concerning the problem of piracy.

Regulation against piracy

a. Relating bodies

The navy, marine and aviation police and GAMAT have their own regulations, and in addition they also carry out joint enforcement activities as "the Coordinating Body for Security at sea".

b. Combination patrol

The ships of the navy, marine police, GAMAT and customs hold joint training against piracy with Malaysian naval ships and Singapore naval ships several times a year.

c. Pirate prevention order control center

The Navy installed the Pirate Prevention Order Control Center in Island of Batam for the Prevention of Pirate Incident in Malacca and Singapore Straits and Philip Channels.

2.9. Sea-borne Cargoes and Passengers

2.9.1. Sea-borne Cargoes

Total volume of sea-borne cargoes handled at all of public ports in Indonesia was reached 519 million tons in 1999, which included the cargo volume handled at non-commercial ports.

(1) Foreign Trade Cargoes

A total of 112,363,938 tons of foreign trade cargoes was handled in 1983 and 338,768,974 tons in 1999. The domestic vessels carried 20,081,234 tons (17.90 percent) of foreign trade cargoes in 1983 and 16,236,366 tons (4.79 percent) in 1999. The foreign vessels carried 92,282,704 tons (82.10 percent) of foreign trade cargoes in 1983 and 322,532,608 tons (95.21 percent) in 1999. The details are shown in **Table 2.9.1**.

(2) Domestic Trade Cargoes

A total of 58,865,372 tons of domestic trade cargoes was handled in 1983 and 180,229,152 tons in 1999. The domestic vessels carried 38,417,079 tons (65.30 percent) of domestic trade cargoes in 1983 and 90,985,556 tons (50.48 percent) in 1999. The foreign vessels carried 20,448,293 tons (34.70 percent) of domestic trade cargoes in 1983 and 89,243,596 tons (49.52 percent) in 1999. The details are shown in **Table 2.9.2**.

(3) Containerized Cargoes

Container traffic has continued to expand rapidly in Indonesia although only a few ports have specialized berths, equipment storage yards and related facilities.

Total TEUs (twenty foot equivalent of unit) amounted to over 2.85 million in 1996 and increased to about 3.1 million in 1998. Based on approximately 10 tons per TEU, this implies about 29 million tons of containerized cargo in 1996 and 31 million tons in 1998.

In 1991 the equivalent figures were 0.9 million TEUs or about 10 million tons of cargo. Container traffic has therefore been increasing by about 20 percent per year, although in the crisis between 1996 and 1998 it still grew by about 6 percent.

Number of containers at Indonesian Sea Port Corporation (PELINDO) Ports in 1995 and 1996 are shown in **Table 2.9.3**.

Tuble World Torongh Trade Surges								
Veen	By Domestic	Vessels	By Foreign	Vessels	Total			
rear	MT	%	MT	%	MT			
1983	20,081,234	17.90	92,282,704	82.10	112,363,938			
1984	18,793,007	14.20	113,841,482	85.80	132,634,489			
1985	15,454,376	16.10	80,760,977	83.90	96,215,353			
1986	8,179,659	8.00	94,429,129	92.00	102,608,788			
1987	6,716,029	6.30	102,767,311	93.70	109,483,340			
1988	5,747,121	4.80	112,937,190	95.20	118,684,311			
1989	4,214,516	3.00	136,226,391	97.00	140,440,907			
1990	6,735,718	4.40	146,071,901	95.60	152,807,619			
1991	5,898,956	3.30	160,909,016	96.70	166,807,972			
1992	6,170,794	3.41	174,642,450	96.59	180,813,244			
1993	6,861,366	3.17	209,836,181	96.83	216,697,547			
1994	8,177,066	3.40	230,586,143	96.60	238,763,209			
1995	5,989,065	2.15	272,230,980	97.85	278,220,045			
1996	24,261,659	7.20	312,801,171	92.80	337,062,830			
1997	10,283,183	3.85	256,795,489	96.15	267,078,672			
1998	9,381,171	3.52	257,405,305	96.48	266,786,476			
1999	16,236,366	4.79	322,532,608	95.21	338,768,974			

Table 2.9.1. Foreign Trade Cargoes

Source : DGSC

 Table 2.9.2.
 Domestic Trade Cargoes

Year	By Domestic	Vessels	By Foreign	Vessels	Total
	MT	%	MT	%	MT
1983	38,417,079	65.30	20,448,293	34.70	58,865,372
1984	46,084,848	71.80	18,072,405	28.20	64,157,253
1985	56,624,760	68.50	25,995,768	31.50	82,620,528
1986	51,639,719	74.20	17,955,368	25.80	69,595,087
1987	61,917,675	73.60	22,224,247	26.40	84,141,922
1988	63,281,600	75.20	20,827,128	24.80	84,108,728
1989	54,702,391	71.50	21,827,775	28.50	76,530,166
1990	55,087,786	56.90	41,680,470	43.10	96,768,256
1991	63,469,856	54.40	53,249,769	45.60	116,719,625
1992	73,029,408	55.05	59,641,871	44.95	132,671,279
1993	76,331,305	58.93	53,207,268	41.07	129,538,573
1994	74,346,352	50.55	72,733,465	49.45	147,079,817
1995	75,478,456	51.45	71,220,215	48.55	146,698,671
1996	90,631,149	53.27	79,502,298	46.73	170,133,447
1997	61,965,146	46.40	71,643,573	53.60	133,608,719
1998	58,718,762	46.91	66,455,031	53.09	125,173,793
1999	90,985,556	50.48	89,243,596	49.52	180,229,152

Source : DGSC

Veen			Unloa	ading			Loa	ding		Total			
rear	PELINDO	20'	40'	TEU	Total Ton	20'	40'	TEU	Total Ton	20'	40'	TEU	Total Ton
		51,829	24,816	101,461	552,496	48,623	25,381	99,385	1,223,083	100,452	50,197	200,846	1,775,579
	II	363,678	210,401	784,480	7,898,633	344,845	211,277	746,928	6,775,148	708,523	421,678	1,531,408	14,673,781
1995	III	154,032	110,632	375,296	3,364,416	165,958	95,345	356,548	3,969,487	319,990	205,977	731,844	7,333,903
	IV	54,945	1,413	57,771	761,289	75,786	1,283	79,312	423,417	130,731	2,696	137,083	1,184,706
	Total	624,484	347,262	1,319,008	12,576,834	635,212	333,286	1,282,173	12,391,135	1,259,696	680,548	2,601,181	24,967,969
	Ι	84,122	28,982	142,086	995,626	74,390	28,755	131,900	1,383,925	158,512	57,737	273,986	2,379,551
		373,193	217,744	808,682	7,615,372	387,997	232,994	853,997	8,042,171	761,190	450,738	1,662,679	15,657,543
1996	III	172,234	95,403	363,440	3,689,037	189,818	108,997	407,812	4,380,302	362,052	204,400	771,252	8,069,339
	IV	77,910	1,773	81,456	1,005,272	72,920	1,386	73,692	497,668	150,830	3,159	155,148	1,502,940
	Total	707,459	343,902	1,395,664	13,305,307	725,125	372,132	1,467,401	14,304,066	1,432,584	716,034	2,863,065	27,609,373
C	DOCO												-

Table 2.9.3. Number of Containers at PELINDO Ports in 1995 and 1996

Source : DGSC

2.9.2. Sea-borne Passengers

Sea transport services (PT. PELNI) operate regular but often infrequent services with relatively large ships on multi-stage routes using ports / terminals owned and managed by others, and carry passengers and some cargoes.

(1) Domestic Passenger

Passenger demand on domestic shipping services has been growing rapidly since the early 1990's. Some of this demand has been accepted by such capacity-up as the steady expansion of PT PELNI's passenger shipping fleet with large modern vessels (built in Germany) being supplied. Demand also rose with the continued expansion of inter-island movement and the work opportunities in Malaysia being partly fed by domestic shipping to the islands of Batam, Tanjung Balai and Bintang.

DGSC data shows that Indonesian ports handled some 10.2 million domestic passengers in 1996 (5.1 million trips). By 1998, total domestic passengers increased to 14.6 million movements. No data on domestic passenger traffic was available for Batam. The details are shown in **Table 2.9.4**.

Veen		Passe	Passenger Arrivals and Departures (million)							
Tear		1996		1998						
PELINDO	TSSS Ports	Domestic	International	Domestic	International					
Ι	10	2.46	0.58	3.66	1.02					
II	6	1.40	0.13	2.14	0.09					
III	8	2.52	0.08	3.08	0.07					
IV	13	3.84	0.05	5.73	0.15					
Batam	1	n/a	2.92	n/a	3.49					
Total	38	10.22	3.75	14.61	4.81					

Table 2.9.4. Summary of Passenger Traffic in 1996 and 1998

Source : DGSC 1999; Excludes passenger traffic not allocated of 66,000 in 1996 and 72,000 in 1998 Note: There were 112 PELINDO ports until late 1999; Total domestic passengers through these 112 ports were 12.4 million in 1996. The 38 TSSS (Transport Sector Strategy Study) passenger ports therefore handled some 82 percent of total PELINDO passenger traffic in 1996 and almost 100 percent of international trip.

(2) International Passenger

International sea passengers are largely short distance travelers from Sumatra (including Batam / Bintan / Tanjung Balai) to Singapore or Malaysia. Travelers are usually Indonesian workers or Singaporean weekend tourists going to Batam / Bintan. Other international routes are to Sabah / Sarawak or the Philippines. Cruise passengers make up only a small proportion of international sea passengers.

In 1996, there were nearly 3.8 million international passengers (arrives and departures) and in 1998 this number had grown to 4.8 million as shown **Table 2.9.4**.

2.9.3. Ferry Boat Passengers and Cargoes

Ferry transport services (PT. ASDP) operate regular and frequent services with relatively small ships on routes between two defined locations normally owned / managed by PT. ASDP, and carry passengers, vehicles and related cargoes.

As of April 2000, there are some 24 private ferry companies, which are operating 46 ferry boats on commercial routes and, among these, three (3) routes are exclusively used by private companies.

Coordination could be improved between DGLC responsible for inland waterways and ferries, and DGSC responsible for sea transportation and the safety aspects of all waterway / sea transportation.

Statistic figures of ferry boat passengers and cargoes since 1987 to 1995 are shown in **Table 2.9.5**.

			000 01 1 01	-	
	1987	1988	1989	1990	1991
Passenger	21,570,727	25,617,924	28,664,859	31,626,598	32,194,981
4- Vehicle	1,972,717	2,158,712	2,380,063	3,642,100	3,038,419
2- Vehicle	1,824,749	1,808,291	1,466,431	1,942,413	2,017,616
Cargo	3,664,455	5,173,709	4,503,699	6,330,354	7,280,586
	1992	1993	1994	1995	
Passenger	37,264,399	39,004,338	44,940,901	45,513,415	
4- Vehicle	3,248,537	3,612,256	4,745,212	4,652,769	
2- Vehicle	2,216,816	2,123,077	1,626,441	3,719,501	
Cargo	7,513,139	9,407,521	8,921,167	10,803,478	

 Table 2.9.5. Passengers and Cargoes of Ferry Boat (1987 - 1995)

Source: DATA ANGKUTAN PENYEBERANGAN TAHUN 1987-1995: DGLC

2.10. Information Technology

2.10.1. Current Situation

Information Technology (IT) in Indonesia has been remarkably developed for the last decade. In public telecommunication field, exchange and transmission systems and numbers of subscribers are growing in quantity and quality using digital technology. Digital mobile (handy phone), cable TV and internet services newly arose. **Table 2.10.1**. shows overview of the IT services.

		1992	1998
Telephone	Main telephone	1,650 k	5,571 k
	ditto density	0.8/100 inhab	2.7/100 inhab
	Mobile (Hp)	36 k	1,066 k
	Total		6,637 k
TV set density		n.a	13.6 /100 inhab
Radio set density		n.a	15.5 /100 inhab
Internet	Provider	0	10
	User	0	300 k
Personal computer		n.a	2,500 k

Table 2.10.1.Overview of IT Services

k = 1,000

According to an announcement of PT. Telkom recently, their ordinal main telephone subscribers are 6.324 million, and mobile phone subscribers, belong to PT. Telkomsel, PT. Satelindo, PT. Excelcomindo and other four (4) service providers, are 2.735 million as of June 2001.

Newly started satellite phone provider PT. Pasifik Satelit Nusantara is expecting some 35 thousands subscribers in the first year with around Rp 6,000 per minute's tariff, and they are planning to distribute the services to rural area by Rp 1,500 per minute for local call and Rp 2,500 for long distance call.

Around forty (40) internet providers have got license. But only ten (10) providers seem to be active. Total users of internet as of the end of year 2000 are estimated 900 thousand approximately. Recently PT. Telkom starts a broadband (512 kbit/s) services using Asymmetric Digital Subscriber Line (ADSL).

Though numbers of subscribers/users are still small comparing to population of the country, many peoples are newly entering mobile phone and internet networks currently.

Since Indonesian satellite telecommunication have serviced-in year 1976, today, eight (8) national satellites are launched and being operated on geo-stationary orbit (GEO). Owners of satellites and its services provided are as shown in **Table 2.10.2**.

Name of Owner	Satellite Name	Band	Capacity	Services
TP. Telkom	Palapa B2R	C-band	24 trps.	Transponder leasing
	Palapa B4	C-band	24 trps.	TV uplink
	Telkom-1	C-band	24 trps.	Teleprogram
		Ext. C-band	12 trps.	INDOSAT
				VSAT
PT. Satelindo	Palapa C1	C-band	24 trps.	Transponder leasing
	Palapa C2	C-band	24 trps.	Uplink & Turnaround
		Ext. C-band	6 trps.	VSAT
		Ku-band	4 trps.	Internet access
PT. Media Citra	Cakrawarta-1	S-band	Eqv. 60 chs.	DBS
Indostar		L-band	MPEG2	VSAT
PT. Pasifik Satelit	Ex. Palapa B1	C-band	24 trps.	VSAT
Nusantara	Garuda-1 (M2A)	C-band	24 trps.	GMPCS
				VSAT
				Multimedia application
				(M2A)

Table 2.10.2 Owners of Satellites and its Services

Major services available by the satellites at present are;

- (1) Transponder leasing (full or part of a transponder),
- (2) Very small aperture terminal (VSAT) services for the speed up to 2 Mbps,
- (3) Direct broadcasting service (DBS) for television and radio,
- (4) Multimedia and Video conferences, and
- (5) Internet connection services among provider's servers and IP gateways.

Such new generation's satellites as Telkom-1 and Garuda-1 provide their services to Asian countries, Papua New Guinea and north Australia too.

Details of satellites and its tariff systems are described in Appendix 2.10.1.

2.10.2. Telecommunication's Market and its Regulations Indonesian Telecommunication Act 36/1999 defines the type of services and its competitive structures as Table 2.10.3.

Type of Services			Structures	Major Providers	
Telephone	Local	Cable	Monopoly *1)	Telkom + KSO	
		Radio	Monopoly *1)	Telkom + KSO, Ratelindo	
	Long dista	nce	Monopoly *1)	Telkom	
	Internation	nal	Monopoly *2)	Indosat	
Data com.	tacom. C		Competition	Telkom, Lintasarta	
Mobile (Hp)	NMT		Competition,	Mobisel	
	AMPS		but to be joined	Komselindo, Telekomind, Metrosel	
	GSM		with Telkom	Telkomsel, Satelindo, Excelkomindo	
	OCS/PCN			Cellnet, Primasel, etc.	
Pager			Competition	Skytelindo, Multipage, etc.	
Satellite com.			Competition	Telkom, Satelindo, MCI, etc.	
Internet			Competition	Indosatnet, Radnet, etc	

 Table 2.10.3.
 Indonesian
 Telecommunication
 Act
 36/1999

Note: *1) up to August 2002 *2) up to August 2003

It is to be noted that, recently the periods of monopoly *for local, long distance and international services* given to PT. Telkom or PT. Indosat have been changed to shorten from the previous schedule, as noticed in the above table.

2.10.3. Trend in Future

Even saying that the Indonesian telecommunications sector has remarkably grown, densities of ordinal telephones, mobile phones (hand phones), internet users and TV program receivers are still low comparing with other middle developing countries. In other words there is big potential to expand these telecom systems/networks.

New technologies such as digital satellite system, broad-band subscriber line system using ADSL or fiber optic cable have already been deployed. Hundreds fiber-core's cable are being installed by telecom curriers and CATV providers at strategic area or section, to enable transmitting various kinds of voice/data signals, broadcasting signal and/or internet signals.

Mobile banking system and e-commerce system between companies has started. Satellite mobile phone service also comes into the field. Study of the 2.5-generation mobile system has started.

If the major telecom markets previously discussed are opened, so many, in type and in numbers, network operators, circuit business enterprises, circuit re-sellers, system/facilities providers and services/contents providers will enter to these markets. It means user can select more suitable system and/or provider, with cheaper fee, for his communication purpose.

In case of DGSC, such system and provider will be selected taking the followings into account:

- (1) Cost; installation/initial and operation costs for user-side terminals, and running/monthly fee to be paid to system/service providers.
- (2) Reliability; in hardware and software, and whether minimum required speed can be kept any time or not.
- (3) Security; the system is open to the public or not, to restrict illegal access.

2.11. Port and Harbors

2.11.1. Port System in Indonesia

Indonesian ports are classified, in accordance with Shipping Law No.21/1992, into two main types i.e. **"Public ports"** and **"Special ports"**. The former are public ports available for public (general user) cargoes and are further subdivided into commercial and non-commercial ports. There are now a total of 111 (excluded Dilli) commercial ports and they are managed and operated by the port corporations (PELINDOS). These 111 commercial public ports generally handle the vast majority of public cargoes and obviously have better capacity than that of the non-commercial ports.

The commercial public ports in Indonesia are classified into two categories, commercial ports managed by four state owned companies (IPC $I \sim IV$) and non-commercial ports directly managed by government local offices (KANPEL) or its working units.

Special ports (and sometimes Special berths) are either privately operated for private cargoes to support manufacturing, forestry, fishing, mining and tourism or are operated by specific state corporations for bulk cargoes such as oil and fertilizer.

Besides these ports, there are ferry terminals under Directorate General of Land Communications (DGLC) and state owned company (ASDP), and fishery ports under the Ministry of Marine Affairs and Fisheries, and Provincial Government.

Number of main ports in each province as of 1994 is shown in **Table 2.11.1**.

A	Duarinas		Commer	cial Port	Non commercial	Constal	F	T-4-1
Area		Province	Adm.	Number	port	Special	Ferry	Total
	1.	D.I. Aceh	IPC I	6	10	25		
	2.	North Sumatra	IPC I	8	45	53		
	3.	West Sumatra	IPC II	3	6	7		
Sumatra	4.	Riau	IPC I	12	43	115		
Sullatra	5.	Jambi	IPC II	3	8	45		
	6.	South Sumatra	IPC II	8	3	69		
	7.	Bengkulu	IPC II	1	3	2		
	8.	Lampung	IPC II	1	11	5	27	519
	9.	DKI. Jakarta	IPC II	3	0	23		
	10.	West Java	IPC II	3	13	35		
Java and Dali	11.	Central Java	IPC III	3	10	56		
Java and Ball	12.	Yogyakarta	IPC III	0	0	1		
	13.	East Java	IPC III	8	18	35		
	14.	Bali	IPC III	3	7	18	19	255
	17.	West Kalimantan	IPC II	7	4	196		
	18.	Central Kalimantan	IPC III	8	3	111		
Kalimantan	19.	South Kalimantan	IPC III	2	4	94		
	20.	East Kalimantan	IPC IV	5	13	138	26	611
	21.	North Sulawesi	IPC IV	3	36	30		
Culomat	22.	Central Sulawesi	IPC IV	2	22	42		
Sulawesi	23.	South Sulawesi	IPC IV	4	37	7		
	24.	Southeast Sulawesi	IPC IV	1	33	9	19	245
	15.	West Nusa Tenggara	IPC III	3	12	19		
	16.	East Nusa Tenggara	IPC III	5	30	19		
Other Island	25.	Maluku	IPC IV	3	56	25		
	26.	Irian Jaya	IPC IV	6	108	32		
		East Timor (Dilli)	IPC III	1	9	2	62	392
Total				112	544	*1,213	**153	2,022

 Table 2.11.1.
 Number of Ports in Each Province

Source: DGSC, DGLC

Note: *Number of special ports in each province is based on data in 1994

**Number of ferry terminals is based on "the development study on nationwide ferry service route in Indonesia"

2.11.2. Classification of Ports

(1) Main Ports under SISTRANAS (The National Transport Development Plan) SITRANAS has been described in detail in the Demand Forecasting Working Paper and proposed a hierarchy for the 112 (including Dilli in East Timor) public ports with two main groups and five sub-groups.

The proposed seaport hierarchy based on functional policy given in SISTRANAS (1996) was as follows:

Primary Trunk Port (1) : International Trunk / Deep Seaports projected to serve direct trade to foreign countries (International direct shipment). Such ports will be provided with a full container terminal.

Secondary Trunk Port (8): Major Trunk ports projected to serve trade to other countries and also transshipment (International shipment and transshipment). Such ports are to be provided with full container facilities;

Tertiary Trunk Port (23): Minor Trunk ports that are projected to serve

national as well as international trade. These ports provide semi-container facilities;

National Feeder Ports (21): These ports provide facilities appropriate for national and intra-regional trade;

Local Feeder Ports (58): These ports provide facilities appropriate for serving intra-regional trade.

Note: Number of ports in brackets is 111 in total except Dilli by late 2000.

SISTRANAS classification of main ports is shown in Table 2.11.2.

Number	Primary	Secondary	Tertiary
1	Batam	Belawan	Lhokseumawe
2		Panjang	Dumai
3		Bojonegara	Pekanbaru
4		Tanjung Priok	Tanjung Pinang
5		Tanjung Perak	Teluk Bayar
6		Tanjung Emas	Palembang
7		Ujung Pandang	Cirebon
8		Bitung	Cilacap
9			Benoa
10			Pontianak
11			Sampit
12			Balikpapan/Kariangau
13			Samarinda
14			Banjarmasin/Batulicin
15			Kendari
16			Anggrek/Kuandang
17			Tenau-Kupang
18			Ambon
19			Sorong
20			Biak
21			Jayapura
22			Kumai
23			Kula Enok
Number of Ports	1	8	23

 Table 2.11.2.
 Trunk Ports under SISTRANAS

Source: DGSC

(2) DGSC Strategic Ports

The DGSC uses a simpler definition of 25 strategic ports which are not ranked and are based on three criteria of 'volume of cargo handled', 'location of port' and 'regional function of port'.

Application of these criteria leads to the selection of 25 ports which handle 70% of all public general cargo and 98% of all containers.

The DGSC strategic ports are shown in **Table 2.11.3**.

Table 2.11.3	. DGSC	Strategic	Ports
--------------	--------	-----------	-------

No.	Province	Port
1	Aceh	Lhokseumawe
2	N. Sumatra	Medan(Belawan)*
3	W. Sumatra	Padang(Teluk Bayur)
4	Riau	Dumai
5	Riau	Pekanbaru
6	Riau	Tanjung Pinang
7	Riau	Batam
8	S. Sumatra	Pelembang
9	Lampung	Panjang*
10	DKI Jakarta	Tanjung Priok*
11	Central Java	Tanjung Emas*
12	East Java	Tanjung Perak*
13	W. Java	Banten/Bojonegara

No.	Province	Port
14	Bali	Benoa
15	E. Nusa Teng	Kupang
16	W. Kalimantan	Pontianak*
17	E. Kalimantan	Balikpapan
18	E. Kalimantan	Samarinda
19	S. Kalimantan	Banjarmasin*
20	N. Sulawesi	Bitung
21	S. Sulawesi	Makassar*
22	Maluku	Ambon
23	Irian Jaya	Sorong
24	Irian Jaya	Biak
25	Irian Jaya	Jayapura

Source: Port Development Operation, DGSC, 1996

Note*: Containaer facilities

2.11.3. Handling Cargoes and Passengers

(1) Quantity of Handling Cargoes and its Share

Cargo handling quantities by major port are shown in Table 2.11.4

Table 2.11.4. Exports and Imports by Main Port and its Share

		INPORTS BY MAIN PORT							
Port			1998		Port	Port 1998			
JAVA	Million	Tonnes	% of Total	% of sub total		Million	Tonnes	% of Total	% of sub total
Jakarta	15.2		31%		Jakarta	14.4		53%	
Surabaya	4.5		9%		Surabaya	2.9		11%	
Semarang	1.5		3%		Semarang	0.9		3%	
Cirebon	0.0		0%		Merak	0.6		2%	
Others	4.2		9%		Others	3.0		11%	
Sub Total		25.4		52%	Sub Total		21.8		80%
SUMATRA									
Belawan	2.4		5%		Belawan	0.4		1%	
Pekanbaru/Dumai	2.0		4%		Pekanbaru/Dumai	0.1		0%	
					Jambi	0.1		0%	
Palembang	0.1		0%		Palembang	0.0		0%	
Panjang	0.8		2%		Panjang	0.1		0%	
Taniung Pinang	0.0		0%		Padang	0.1		0%	
Others	9.2		19%		Others	2.2		8%	
Sub Total		14.5		30%	Sub Total		3.0		11%
KALIMANTAN									
Pontianak	0.4		1%		Pontianak	0.1		0%	
Banjarmasin	0.6		1%		Banjarmasin	0.1		0%	
Balikpapan	0.4		1%		Balikpapan	0.5		2%	
Tarakan	0.1		0%		х	-			
Others	4.4		9%		Others	0.6		2%	
Sub Total		5.9		12%	Sub Total		1.2		4%
SULAWESI									
Makassar	0.4		1%		Makasar	0.2		1%	
Bitung	0.2		0%		Bitunø	0.0		0%	
Others	0.3		1%		Others	0.2		1%	
Sub Total		0.9		2%	Sub Total		0.4		1%
BALI/NTT									
Benoa	0.0		0%		х	-			
Kupang	0.0		0%		х	-			
Others	0.2		1%		x	-			
Sub Total		0.3		1%	Sub Total				0%
MALUKU									
Ambon	0.2		0%		Ambon	0.0		0%	
Amamapare	1.2		3%		х	-			
Others	0.4		1%		Others	1.0		4%	
Sub Total		1.9		4%	Sub Total		1.0		4%
TOTAL EXPORTS	48.9		100%	100%	TOTAL IMPORTS	27.4		100%	100%

Source:BPS and Consultants

(2) Quantity of Passenger in Strategic Ports

Domestic Passengers

Domestic passenger quantities by major port are shown in **Table 2.11.5**. Indonesian ports handled some 10.2 million domestic passengers in 1996 (5.1 million trips). The largest quantity of domestic passenger in 1998 is 1,404 thousand (9.6 percent) in Tanjung Pinang followed by 1,343 thousand (9.2 percent) in Tanjung Perak, 1,102 thousand (7.5 percent) in Makassar.

International Passengers

International passenger quantities by major port are also shown in **Table 2.11.5**. The largest quantity of international passenger in 1998 is 3,486 thousand (72.53 percent) in Batam followed by 618 thousand (12.8 percent) in Tanjung Pinang, 247 thousand (5.1 percent) in Dumai.

(3) Ferry Boat Cargoes and Passengers by Traffic Routes

Statistics of the top five ports of ferry route in 1998 are shown in **Table 2.11.6**. The ferry boats which serviced between Merak and Bakauheni, carried the largest passenger of 14,029,736, followed by 13,575,435 (between Ujung and Kamal) and 5,323,194 (between Banyuwangi and Gilimanuk).

(In Thousand Passengers Per Vear)							-					
		1996 1998										
	Б			1996 Total	1000		1998 Total	1000		SISTRANAS(Ca		HOL OTHER
No.	Prov.	Province	PORT NAME	Pax (Dom)	Pax(Int)	Total 1996	Pax (Dom)	1998 Total Pax(Int)	Total 1998	rgo Port)	PELINDO	RATING
1	19	Fast Java	Taniung Daval	1.024	10	1.044	1 242	4	1 9 4 7	C		Н1
2	15	Piou	Tanjung Perak	011	365	1,044	1,343	618	2 022	C		Н1
2	4 99	South Suloweri	Malagaan	749	505	1,270	1,404	010	1 104	B		H1
3	23 0	DKL Jakanta	Taniung Driak	672	197	733 800	1,102	2 02	1,104	B		Н1
4 5	9	DKI Jakarta		220	100	445	317	947	1,005	C		H1
3 6	4		Dumai	209	100	443	440 950	0	095	C		H1
0	14		Benoa	322	Q	344	239	0	207	B		H1
	21	North Sulawesi	Bitung	206	Z	208	262	- 1	262	C D		н1
8	16	East Nusa Tenggara	Tenau Kupang	120	-	120	150	1	151	D		H1
9	2	North Sumatera	Belawan	108	107	215	203	147	350		BIDA	н1 Н1
10	4	Riau	Batam	-	2,911	2.911	-	3,486	3,486		DIDA	H2
11	23	South Sulawesi	Pare Pare	386	6	392	434	2	436	D C		H2
12	25	Maluku	Ambon	385	-	385	470	-	470	C		H2
13	17	West Kalimantan	Pontianak	354	-	354	433	-	433			
14	25	Maluku	Ternate	354	-	354	810	-	810	D C		
15	20	East Kalimantan	Balikpapan	351	-	351	962	-	962	C		
16	19	South Kalimantan	Banjarmasin	337	-	337	462	-	462			
17	2	North Sumatra	Sibolga	238	-	238	282	-	282	D		
18	26	Irian Jaya	Sorang	192	-	192	226	-	226	C		
19	26	Irian Jaya	Biak	126	0	127	158	-	158	C		пΖ
20	24	South East Sulawesi	Kendari	329	-	329	378	-	378	C		
21	4	Riau	Bengkalis	308	-	308	368	-	368	D		
22	11	Central Java	Tanjung Emas	293	23	316	318	8	326	C		
23	20	East Kalimantan	Nunukan	204	34	238	312	130	442	D		
24	22	Central Sulawesi	Pantoloan	215	-	215	180	14	194	D		
25	2	North Sumatra	Gunung Sitoli	202	-	202	256	-	256	D		
26	1	Aceh	Lhokseumawe	-	-	0	-	-	0	С		
27	4	Riau	Selat Panjang	194	-	194	478	-	478	D		
28	26	Irian Jaya	Jayapura	190	0	190	250	-	250	С		
29	18	Central Kalimantan	Sampit	160	-	160	349	-	349	С		
30	20	East Kalimantan	Samarinda	153	-	153	194	-	194	C		
31	6	South Sumatera	Palembang	148	-	148	287	-	287	C		
32	6	South Sumatera	Muntok	138	-	138	311	-	311	D		
33	18	Central Kalimantan	Pankalan Bun.	136	-	136	136	-	136	D		
34	15	West Nusa Tenggara	Lembar	128	18	146	62	47	109	С		
35	1	Aceh	Malahayati	123	-	123	208		208	D		
36	3	West Sumatera	Teluk Bayur	57	0	58	67	0	67	C		
37	4	Riau	Pekanbaru	39	-	39	5	-	5	C		
38	5	Jambi	Jambi	30	-	30	122	-	122	С		
				10,217	3,747	13,964	14,606	4,806	19,412			
		SISTRANAS CARGO POL	RT CALASSIFICAT	J	ICA							
		A Primary		H1	Strategic Hub		Source:	DGSC				
		B=Secondary	C=Tertiarv	H2	Secondary Hub							
		D=Feeder										

Table 2.11.5. Number of Passenger by Major Ports

Table 2.11.6. Top Five of Ferry Boat Route in 1998

Ferry Route	Passengers	Vehicles	Freight	Trips
Merak – Bakauheni (West Java / Lampung)	14,029,736	1,887,663	5,291,295	34,148
Ujung – Kamal (East Java)	13,575,435	1,522,377	1,731,325	92,835
Banyuwangi – Gilimanuk (East Java / Bali)	5,323,194	1,096,954	2,447,961	71,214
Padangbai – Lembar (Bali / Nusa Tenggara Barat)	983,447	169,777	654,434	10,584
Balohan(Saban) – Malahayu (DI Aceh)	161,789	25,553	10,769	982

Source: DGLC

2.11.4. Port Facilities

Port facilities in major ports are shown in **Table 2.11.7**.

Port	Strategic	SISTRANS	Container Berth	Conventional	Total
	Port (TSSS)		(Length)	Berth (Length)	Meters
Tanjung Priok	Primary	A/B	1,860	6,370	8,230
Tanjung Perak	Primary	С	1,190	5,500	6,690
Belawan	Primary	A/B	500	2,580	3,080
Makassar	Secondary	A/B	490	1,540	2,030
Teluk Bayur	Secondary	С	150	1,201	1,351
Panjang	Secondary	A/B	298	1,007	1,305
Tanjung Emas	Secondary	С	345	775	1,120
Batam	Primary	A/B	-	1,000	1,000
Dumai	Secondary	С	-	893	893
Pontianak	Secondary	С	-	847	847
Cirebon	Tertiary	С	-	845	845
Banjarmasin	Secondary	С	-	830	830
Samarinda	Tertiary	С	-	827	827
Bitung	Secondary	A/B	-	827	827
Lhokseumawe	Tertiary	С	-	771	771
Palembang	Secondary	С	265	475	740
Ambon	Tertiary	С	-	617	617
Banten/ Bojonegara	Primary	A/B	-	500	500
Tanjung Pinag		С	-	500	500
Sampit	Tertiary	С	-	416	416
Pekanbaru	Secondary	С	-	346	346
Jambi	Secondary	С	-	344	344
Kendari		С	-	331	331
Balikpapan	Secondary	С	-	329	329
Sorong	Tertiary	С	-	280	280
Bengkulu	Tertiary	С	-	275	275
Jayapura		С	-	270	270
Biak		С	-	267	267
Pantoloan	Tertiary	D	-	250	250
Malahayati		D	-	250	250
Tenau Kupang	Tertiary	С	-	223	223
Lembar	Tertiary	С	-	218	218
Benoa		С	-	216	216

Table 2.11.7. Port Facilities in Major Ports

Source: JICA Report 1999 (The Study on the Port Development Strategy)

CHAPTER 3.

EXISTING PLANS AND STRATEGY RELATED TO MARITIME TRAFFIC SAFETY SYSTEM

CHAPTER 3. EXISTING PLANS AND STRATEGY RELATED TO MARITIME TRAFFIC SAFETY SYSTEM

3.1.General

During the past 20 years, several study reports related to the Study have been compiled by JICA or other relevant authorities and some of the plans in the reports have been put into implementation.

Especially both the survey reports of "Survey Report on Long Term Development Plan of Maritime Communication System" issued in March 1982 by JICA and "The Master Plan on the Development of Aids to Navigation System" issued in October 1985 by JICA had the master plans which covered until the year 2000 and basically the Study is placed in serial study of them.

Therefore, before formulating the master plans of the Study, it is necessary to grasp the contents of the past study reports and to reflect them in the Study. **Table 3.1.1.** shows the list of past study reports related to the Study.

Title of Reports	Issued Date	Issued By	Contents
Survey Report on Long Term Development Plan of Maritime Communication System	Mar. 1982	JICA	Master plans for maritime communication system during the years from 1983 to 1999
The Master Plan on the Development of Aids to Navigation System in the Republic of Indonesia	Oct. 1985	JICA	Master plans for aids to navigation and its supporting facilities during the year from 1985 to 2000
The Study on Maritime Safety Plan concerning Search and Rescue	Feb. 1989	JICA	Long-term development plans up to year 2005 and short-term plans selected as urgent improvement projects from the long term plans concerning Search and Rescue
Feasibility Study in Vessel Traffic Management Services	Jun. 1998	French Consultant	Feasibility study report for VTMS establishments along Sea Lane I and Sea Lane II
Special Assistance for Project Sustainability (SAPS) for Maritime SAR Telecommunication System Project	Mar. 2000	JBIC	The study of the present status of the Marine Search & Rescue Telecommunications System Project and proposals for solutions of the problem
Basic Design Study Report on the Project for Rehabilitation for Medium Wave Radio Beacon Stations	Nov. 2000	JICA	The study to install DGPS stations instead of Medium Wave Radio Beacon
Navigation Safety Project by German Loan	Jun. 2001	German Consultant	German loan project placing visual aids to navigation along the Sea Lane I, II and III
Technical Co-operation in the Field of Maritime Safety Operation and Information Technology	Nov. 2001	JICA	Setting up maritime safety information network by computer system

Table 3.1.1. Past Study Reports Relating to the Study
3.2. "Survey Report on Long Term Development Plan of Maritime Communication System" Issued in March 1982 by JICA

Along with the master plan "Survey Report on Long Term Development Plan of Maritime Communication System" (F-TA-193) issued in March 1982 and a feasibility study report "F-ST-12 Program", DGSC has implemented Maritime Telecommunication Phase-I, II and III projects through the year 1983 to 1997.

3.2.1. Master Plan in 1982

In the master plan which covers until the year 2000, the whole period has been broadly divided into three (3) development programs and outlined below:

 Urgent development, aiming at implementation of mainly 1st class coast stations including Balikpapan and Sorong 2nd class stations and replacement of UHF link in Ambon coast station. (scheduled to be implemented over REPELITA III and IV)

Note: REPELITA means national five-year plan in Indonesia.

- (2) Short term development, intending to supplement the F-ST-12 program and improvement of mainly 2nd and 3rd class coast stations and to install Narrow-Band Direct-Printing (NBDP) and Digital Selective Calling (DSC) equipments to the 1^{rt} class coast stations. (scheduled to be implemented during REPELITA IV)
- (3) Long term development, aiming at implementation of mainly 3rd and 4th class coast stations. (scheduled to be implemented over the periods of REPELITA V and VI)

3.2.2. Implementation of the Projects

After the master plan was issued, number of coast stations have been considerably increased, and there has been some changes in the station classification as given in **Table 3.2.1**.

In addition to the increment in the station number, formerly discussed Future Global Maritime Distress and Safety System (FGMDSS) was implemented by Global Maritime Distress and Safety System (GMDSS) in phase-III project, and Navigational and meteorological warning telex (NAVTEX) system was also introduced in that project following the Amended SOLAS 88, RR WARC-Mobile 87 and coordination results of NAVAREA-XI.

Note.: NAVAREA means navigational warning area(s) determined by IMO and IHO. The world (but between 60-degree north and south) is divided into 16 areas.

	Number of stations								
		As of End of	Present	GMDSS					
Class	MP in 1982	Phase-III	(2001)						
Ι	9	9	9	8					
II	2	8	8	5					
III	12	20	20	13					
IV-A	14	96	103	4					
IV-B	56	84	81	-					
Total	93	217	221	30					

Table 3.2.1. Number of Coast Stations

Note Above classification at present is as follows:

Class	Type of Services	Operation	Function at
		Hours	at the District
Ι	Maritime mobile, including	24h	Center
	public telecom service		
	Fixed service		
II	Maritime mobile, including	16-24h	Sub-Center
	public telecom service		
	Fixed service		
III	Maritime mobile, including	12-16h	
	public telecom service		
	Fixed service		
IV-a	Maritime mobile services	8-12h	
	Fixed service		
IV-b	Fixed service only	8h	

Table 3.2.2. shows the schedule-wise comparison between the master plan and the actual implementation.

- (1) Phase-I project was performed in general by the plan F-ST-12 and the urgent program (U-1) of the master plan F-TA-193.
- (2) Phase-II project was performed based on the short term program (S-1, S-2, S-3) but improvement of the 2nd class coast stations were for Sabang, Banjarmashin, Balikpapan, Semarang, and Sorong instead of Teluk Bayur, Cilacap and Kupang stations. As the 3rd class coast stations, only Samarinda station was included. The 1st class coast stations were improved in the main phase-II project and its addendum project along with this short term program. And it is noted that in this project DSC and NBDP consoles were installed at Belawan, Jakarta, Surabaya and Ujung Pandang (Makassar) coast stations for smooth transition to GMDSS.
- (3) The phase-III project was executed under the specifications meeting with

full requirements of GMDSS. The transmitters used for DSC and NBDP require to realize very stringent frequency stability, therefore new high-performance transmitters have been installed in this phase-III project. In phase-III project NAVTEX transmitters were introduced in Jakarta, Ujung Pandang, Ambon and Jayapura.

Actual implementations of the coast stations in each phase are summarized in **Table 3.2.3**.



 Table 3.2.2.
 Comparison of Implementation Schedule by Master Plan and Projects

CLASS	STATION	F-ST -12	F-ST PLANS BY F-TA-193 -12 FOR REPELITA				ACTUAL IMPLEMENTATION BY		
		II	Ι	IV	V	VI	Phase I	Phase II	Phase III
I	Belawan Dumai Jakarta Surabaya Ujung Pandang Bitung Ambon Jayapura Palembang	00000000	0	0000000000			• • • • •		$\odot \odot \odot \odot \odot \odot \odot$
II	Sabang Teluk Bayur Banjarmasin Balikpapan Cilacap Kupang Semarang Sorong	O O ²	0 0	00 00	0 0		• 2	• • • •	$ \textcircled{\begin{tabular}{lllllllllllllllllllllllllllllllllll$
III	Pontianak Kendari Panjang Cirebon Batu Ampar Tarakan <i>Dili</i> Pantoloan Ternate Merauke Benoa	O ²		0 0	00 00	0 0 0	•2		
IV	Donggala Biak Tanjung Uban Lembar Tanjung Pinang⁴ Jambi Sibolga Manokwari Tanjung Balai Karimun Samarinda Fak-fak		0	0 0	0 ³ 0 0 0	00000		●	 ⊙¹ ⊙¹ ⊙¹ ⊙

Table 3.2.3.Master Plan F - TA - 193 vs. Actual Implementation (1/2)Note : For symbols used here, see the Legends at the end of this table.

Table 3.2.3.Master Plan F - TA - 193 vs. Actual Implementation (2/2)

		F-ST	PLA	NS BY	Y F-TA	-193	ACTUAL		
CLASS	STATION	-12	FOR REPELITA			IMPLEMENTATION BY			
		II	Ι	IV	V	VI	Phase I	Phase II	Phase III
	Tahuna								•
	Panarukan					0			
	Sanana								\odot
	Sampit					0			
IV	-								
	95 stations				0				
	108 stations					0			
	26 supporting vessels to								\odot^5
	aid Navigation								
	5								

LEGENDS :

- **O** Stations where general improvement is planned.
- Stations where general improvement has been made in the project.
- Stations where the GMDSS facilities have been provided in addition to the general improvement.
- ¹ Provision of GMDSS equipment similar to the phase III equipment, by DGSC's own budget.
- ² Provision of Auto alarm equipment only.
- ³ In phase III project, Pantoloan coast station instead of Donggala was upgraded.
- ⁴ GMDSS equipment has been moved to Sei Kolak Kijang.
- ⁵ Fifteen (15) ships furnishing GMDSS equipment have been purchased by other projects, in addition to 11 stations at phase III project.

3.3. "The Master Plan on the Development of Aids to Navigation System in the Republic of Indonesia" Issued in October 1985 by JICA

3.3.1. Visual Aids to Navigation

(1) Status of visual aids to navigation

According to the Master Plan in 1985, there were 1092 lighted and 987 unlighted visual aids to navigation in Indonesia.

It gave the number of 3.3 units of lighted visual aids to navigation per 100 nautical miles along the coast lines in Indonesia, while in the developed countries there were 25 units per 100 nautical miles.

As a result, it was not sufficient to meet the requirements at that time. Details of visual aids to navigation are shown in **Table 3.3.1**.

Table 3	3.3.1.	Visual	A i d s	t o	Navigation	o n	Master	Plan
							As of Mar	r. 1984

			Type o	f Aids to N	laviga	tion		
DIACE			lighted			u	nlighte	d
FLACE	Light	Light	Light	Harbor	total	Small	Day	Total
	house	beacon	buoy	light	total	buoy	mark	Total
BELAWAN	3	17	24	6	50	34		34
SABANG	4	19	13	2	38	28	9	37
SIBOLGA	1	7		1	9		3	3
DUMAI	2	19	29	7	57	7		7
TG. PINANG	19	25	15	13	72	63	113	176
TLK BAYLUR	9	18		6	33	26	16	42
TG.PRIOK	26	48	34	4	112	44	12	56
PALEMBANG		39	22	2	63	3	6	9
PONTIANAK		12	10	1	23	19	6	25
SURABAYA	10	22	19	7	58	20	25	45
SEMARANG	7	11	6	2	26	2	18	20
CILACAP	2	13	20		35	23	2	25
BENOA	9	18	5	2	34	15	24	39
KUPANG	10		3	15	28		10	10
SMARINDA	2	51	68	2	123	35	115	150
BANJARMASIN	6	14	20	2	42	8	2	10
BALIKPAPANN	1	8	11		20	6		6
UJUNG PANDAN	11	7	4	10	32	5	54	59
KENDARI	1	17		5	23		11	11
BITUNG	12	4	1	34	51	15	60	75
AMBON	4	11		29	44	19	61	80
SORONG	4	29	19	3	55	28	24	52
JAYAPURA	2	18	3	4	27	14		14
MERAUKE	1	4	3	1	9	1	1	2
Total (Feb.1984)	146	431	329	158	1064	415	572	987
Add (Mar. 1984)	3	7	13	5	28			
Total	149	438	342	163	1092	415	572	987

Source: Master Plan, 1985, JICA

(2) Distribution and coverage

The visual aids to navigation were scattered around the coasts.

Along Sumatera	348
Along Jawa	210
In Fores sea area	62
Along Karimantan	213
Along Sulawesi	106
Around west Irian area	125

There were 272 coastal lighthouses and beacons, whose coverage of which was ten miles or over.

(3) Energy source for lights

The energy sources for lighted visual aids to navigation were various sources, which are shown in **Table 3.3.2**.

As regards the energy sources by type for aids to navigation, diesel generators and commercial electricity were mainly used. These two sources accounted for 88% of the energy for lighthouses.

While acetylene gas accounted for 41% and 33% of light beacons and light buoys respectively.

					As	s of Feb.	1984
Name of Aid	Diesel	Commercia	Electric			Petroleu	
of Navigation	Genrator	1	Battery	Actylene	Propane	m	Total
	111	16	1	15	3	0	146
Lighthouse	76%	11%	1%	10%	2%	0%	100%
		88%			12%		100%
Light Beacon	0	25	174	178	54	0	431
	0%	6%	40%	41%	13%	0%	100%
		46%	54%			100%	
	0	59	7	3	0	89	158
Harbour Light	0%	37%	4%	2%	0%	56%	100%
		42%			58 %		100%
	0	0	181	110	38	0	329
Light buoy	0%	0%	55%	33%	12%	0%	100%
0 0		55%			45%		100%
	111	100	363	306	95	89	1064
total	11%	9%	34%	29%	9%	8%	100%
		54%			46%		100%

Table 3.3.2. Energy Source of Light

(4) Construction materials of lighted aids

The construction materials of tower structures were divided mainly into three categories of iron, stone and wood.

Material of existing on-shore lighted aids to navigation are shown in **Table 3.3.3**.

Name of Aid of	Iron			Not-		
Navigation	(Metal)	Stone	Wooden	described	Total	Remarks
Lighthouse	90	5	3	42	140	
Light Beacon	186	0	7	165	358	
Harbour Light	63	6	22	69	160	
others	4	0	0	25	29	Note
Tatal	343	11	32	301	687	
Total	49.93%	1.60%	4.66%	43.81%	100.00%	

Table 3.3.3. Construction Materials of Aids to Navigation

Source: Master Plan, 1985, JICA

Note: Radio mast, oil platform, lamppost, oil barge, mooring, etc. Source: List of Lights, Indonesia, 1982

(5) DGSC's non-property lights

There were a total of 227 lights as DGSC's non-property lights owned and being maintained mainly by PERTAMINA (State-Owned Oil Company) for their operations. Details are shown in **Table 3.3.4**

Oruman	Light	Light	Harbour	
Owner	Beacon	Buoy	Light	Total
PN PERTAMINA	56	118		174
OTORITA BATAM	11	3	2	16
PT INALUM	1	1	1	3
PN ANEKA TAMBANG	2			2
P L N		4	1	5
DITJENDAT	6	1		7
PT Free Port/tembaga Pure	10	10		20
Total	86	137	4	227

Table 3.3.4. Aids to Navigation of N on-Property

Source: DGSC, Dec. 1983

3.3.2. Radio Aids to Navigation

In the Master Plan in 1985, the status of Radio aids to navigation in Indonesia stood in rather developing stage.

(1) Medium wave radio beacon stations

The implementation of 1^{st} phase project had already undergone for the establishment of eighteen stations on Jawa sea areas.

The locations of eighteen (18) medium radio beacon stations are shown in **Figure 3.3.1**.



Figure 3.3.1. Location Map of Medium Wave Radio Beacon Stations

1	Sabang	7	Cilacap	13	Tg. Mandar
2	Simedang Island	8	Jamuang Island	14	Uj. Pandang
3	Tg. Priok	9	Tg. Selatan	15	Ambon
4	Pontianak	10	Benoa	16	Bitung
4 5	Pontianak Pesemut Island	10 11	Benoa Balikpapan	16 17	Bitung Ram sorong

(2) Radar beacon stations (Racon)

Three radar beacon stations had been established at One Fatham Bank, Nanka Island and Karang Jamuang as an annex to lighthouses in 1984. They were operated by District of Navigation Offices of Dumai, Palembang and Surabaya respectively.

3.3.3. Supporting Facilities for Aids to Navigation

In order to support the maintenance and operation of aids to navigation, various types of vessels as well as buoy bases, dockyards, and workshops were available to meet the operational requirements.

However, only a few of 1st class Districts of Navigation had all installations of such facilities, and the development and rehabilitation were needed for the full and reliable support to navigation.

(1) Vessels for aids to navigation services

Type and number of vessels belonged to Districts of Navigation are shown in **Table 3.3.5**.

Table 3.3.5.	Type and Numb	oer of Vessel for	Aids to Navigat	tion Services
			As of	Feb. 1984

	TYPE OF VESSEL							
Place	Buoy tender	Supply vessel	Aids tender	Insption boat	Survey vessel	Survey craft	others	Total
Belawan			3					3
Sabang			2					2
Sibolga			1					1
Dumai	1	1	3	2				7
Tg. Pinang			4	2				6
Tlk. Bayur			1					1
Tg. Priok	2	2	4		1	4	1	14
Palembang			6	1				7
Pontianak			2					2
Surabaya	2	2	4	1				9
Semarang			3					3
Cilacap			1					1
Benoa			1					1
Kupang			2					2
Samarinda	1		2	1				4
Banjarmasin			2	1				3
Balikpapan			1					1
Uj. Pandang			1					1
Kendari			1					1
Bitung			3					3
Ambon			1	1				2
Sorong	1	1	2	3				7
Jayapura				8				8
Merauke				2				2
Total	7	6	50	22	1	4	1	91

Source: Master Plan, 1985, JICA

Most of the vessels were aged and many of them were to be scrapped, or included in the scrapping plan by 1988/89.

Type and number of vessel in the scrapping plan are shown in **Table 3.3.6**.

	0
Type of Vessel	Number
Supply vessel	1
Aids tender	27
Inspection and Service boat	22
Total	50

Table 3.3.6. Scrapping Plan of Vessels for Aids to Navigation Services

Source: Master Plan, 1985, JICA

(2) Buoy bases

There were five buoy bases at Dumai, Tg. Priok, Surabaya, Samarinda and Sorong, which covered the whole area of Indonesia.

(3) Workshop

All Districts of Navigation have the workshops installed for carrying out relevant works, but further installations of necessary equipment were required.

(4) Gas plant

A total of twenty nine (29)% of lighted aids to navigation were powered by acetylene gas.

However, needs were not being sufficiently met, due to the limited supply capacity of gas at the plant.

(5) Jetty

The supporting facilities of jetties for aids to navigation service vessels were insufficient, and further development was required for a number of Districts of Navigation.

(6) Procurement of spares

At first, the procurement system had been established for spares. As a matter of fact, however, spares became insufficient because of the limited budget available.

3.3.4. Long Term Plan up to the Target Year of 2000

(1) Visual aids to navigation

The number of visual aids to navigation categorized to be developed and improved up to year 2000 is shown in **Table 3.3.7**

The master plan required new establishment of 908 lighted aids to navigation up to years 2000. The total number was to reach 2000 units and to be improved 6.50 units per 100 nautical miles.

r	-					-		
	Dovolo		Improvement					
	Existing	Develo	Luminous	Monitoring	Electrific	Automatiz		
	_	pment	range	of buoys	ation	ation		
Lighthouse								
(on land)	149	190	14	-	3(3)	3		
Lighthouse								
(off shore)	0	11	47	-	54(21)	-		
Light beacon								
(incl. Harbour	599	335	-	-		-		
RLB	2	22	-	-		-		
Light buoy	342	350	-	55	38(17)	-		
	1092	908	01		05			
total	2000		61	55	95	3		

Table 3.3.7. Long Term Plan of Visual Aids to Navigation

():Electrification planned in improvement in luminous and monitoring of buoy Source: Master Plan, 1985, JICA

(2) Radio aids to navigation

The number of radio aids to navigation to be developed up to years of 2000 was fifty seven (57) of medium wave radio beacon stations including eighteen (18) stations under implementation and seventy (70) radar beacon stations including the existing three (3) stations.

(3) Supporting facilities for aids to navigation services

The Improvement plan for supporting and logistic facilities is shown in **Table 3.3.8**.

Table 3.3.8. Long Term Improvement Plan for Supporting Facilities

Item Facilities	No. of Distric for which Pla	t of Navigation n is estblished	Required areas equipment no.
workshop		17	4370m2
Equipmont	91	8	equipment list A
Equipment	21	13	equipment list B
Open storage		17	11000m2
Store House	19		2740m2
Jetty		16	16place

Source: Master Plan, 1985, JICA

3.3.5. Aids to Navigation developed and improved by Loan

After the formulation of Master Plan in 1985, the aids to navigation in Indonesia have been mainly developed and improved by the foreign loan including Japan Official Development Assistance (ODA).

The aids to navigation projects by loan since 1985 are summarized in **Table 3.3.9**.

Country	Year	Project Amount (Thousand US\$)	Lighthouse	Light Beacon (30m)	Light Beacon (20m)	Light Beacon (10m)	Light Buoy	MFB	RACON	D-Omega	Workshop	Project Area
France	1986	11,551	32	20					6	5		Α
UK	1987	16,170	17	15		15			6			Α
USA	1987	5,990			56	62			49			Α
Japan*	1987	31,112						18				Α
USA	1991	9,000				154			25			Α
Spain	1992	16,143	25	24	13	38	60					Α
Japan*	1993/94	26,100	5	11	8	11	51				5	E
France	1994	4,408		15	11							W
German*	1999	21,800	11	10	5	8	119				5	S
Tot	al	142,274	90	95	93	288	230	18	86	5	10	

Table 3.3.9. Number of Aids to Navigation developed andimproved by Loan

As of Dec.2001

Note:

- 1. * shows turn-key project.
- 2. Exchange rate:

Year 1986 US1=FFR6.9261, Year 1987 US1=144.6370, Year 1993 US1=118.73 US1=2,066, Year 1994 US1=100.18 US1=Rp.2,158, Year 1994 US1=FFR5.5520, Year 1999 US1=DM1.8363 Contracts of USA,UK and Spain project were contracted on the basis of US3.

- 3. German project is on going.
- 4. "A", "E", "W" and "S" of Project Area mean "All the area", "Eastern Indonesia", "Western Indonesia" and "Around Sea lanes", respectively.

3.4. "The Study on Maritime Safety Plan Concerning Search and Rescue" Issued in February 1989 by JICA

3.4.1. Short Term Development Plan

The objective of the study was to formulate a short-term development plan selected as urgent improvement projects from the long-term development plans (up to year 2005) related to the Maritime Safety Plan concerning Search and Rescue.

(1) Search and Rescue System

Construction of Maritime Safety Rescue Ships

Maritime safety rescue ships with long cruising range were required as shown in **Table 3.4.1** and major particulars by ship's class is shown in **Table 3.4.2**.

Table 3.4.1. Number of Ships by Class to be Newly Constructedand Planned Base

Ship's Class	Number of	Planned Base
	Ships	
Class I-A	3	Tg. Priok, Surabaya, Ujung Pandang
Class I-B	2	Tg. Uban, Belawan
Class II	2	Tg. Priok, Surabaya

Table	3.4.2.	Major	Particulars	b y	Ship	's	Class

Particulars	Ship's Class				
	Class I-A	Class I-B	Class II		
Cruising range	5,000 NM	3,000 NM	520 NM		
Length	74 m	59 m	35 m		
Width	10 m	8 m	6.3 m		
Depth	5 m	4.5 m	3.4 m		
Gross Tonnage	1,000 ton	500 ton	100 ton		
Main engine	1,500 HP x 2	1,300 HP x 2	2,400 HP x 2		
Speed	15 Knots	15 Knots	26 Knots		

Organizing Special Rescue Teams and, Research and Development for Rescue Technology

In order to surely and effectively rescue from marine accidents, four teams (one team consists of five members) should be organized in Jakarta and Surabaya bases. The teams were to be professionally trained at a specific training facility. **Prevention of Marine Disasters**

To cope with marine disasters, the following equipment and materials should be provided on board the maritime safety rescue ships as shown in **Table 3.4.3**. and at shore bases as shown in **Table 3.4.4**.

Table 3.4.3. Equipment and Materials to be Provided by Class-wise Ships

Equipment and materials	Class		
	I-A	I-B	II
Oil boom	400m	200m	-
Chemical dispersant	2 kltr	2 kltr	-
Foam concentrate	2 kltr	2 kltr	-
Fire-fighting devices	30 sets	30 sets	10 sets
Handy oil recovery devices	10 sets	10 sets	5 sets
Safety devices for dangerous chemicals	3 sets	3 sets	2 sets
Gas indicators	2 sets	2 sets	2 sets

Equipment and materials	Shore Base						
	Belawan	Tg. Uban	Tg. Priok	Surabaya	Uj. Pandan		
Oil boom	1,600m	1,600m	1,400m	1,400m	1,400m		
Oil skimmer	100kl/hr x						
	1unit	1unit	1unit	1unit	1unit		
	30kl/hr x						
	1unit	1unit	1unit	1unit	1unit		
Chemical dispersant	68 kl						

Table 3.4.4. Equipment and Materials to be Provided to Shore Base

(2) Maritime Safety and SAR Communications and Information System Installation of EPIRB onboard

Considering a great number of accidents involving ships for domestic service, it was proposed to install EPIRB on board 6,600 vessels that had not yet installed.

Establishment Plan of MES (TTY Message Exchange System)

The MES for promptly and accurately transmitting SAR information to SAR-related organizations was planned to install at eight KANWILs except KANWIL III in Jakarta where the MES had already been planned by DGSC.

(3) Harbour Traffic Control System in Surabaya

It was proposed that introduction of traffic control system suitable for each port of Surabaya, Belawan and Tg. Priok was necessary. Surabaya Port, among the above three ports, had priority to establish because it was the prosperous and one of the busiest port in Indonesia.

(4) Training System for Maritime Safety and SAR Personnel

It was strongly suggested to urgently establish a Maritime Safety Training Center (MSTC) having the following functions in DGSC.

Training of newly recruited personnel

Re-training of present personnel

Training of special technologies

Research and development related to special technology and methodology

(5) Organization and System

The organization for commanding and operating ships should be newly established in DGSC and Maritime District Offices (KANWILs). If the following organization was under the jurisdiction of DGSC and Head of KANWIL, prompt and efficient rescue from marine accidents could be attained.

Operation Center and its related organization

Reinforcement of ship repair and maintenance personnel for maritime safety rescue ships

Maritime disaster prevention system and its organization

Special rescue system and its organization

Harbour traffic control system and its organization

Establishment of MSTC

3.4.2. Long Term Development Plan

The objective of the study was to establish a Master Plan for Maritime Safety concerning SAR including the review of the organizational set-up, and education and training institute and investment plan up to year 2005.

(1) Maritime Safety and, Search and Rescue System

Improvement of Maritime Safety Rescue Ships

The improvement of maritime safety rescue ships was planned in Table 3.4.5.

Class	Total No. Required (A)	Existing No. (B)	Balance (A)-(B)	Scrapping by 2005	Balance to be improved & replaced
I-A	6	0	6	0	6
I-B	5	0	5	0	5
II	21	9	12	0	12
III	33	16	17	5	22
IV	37	33	4	0	4
V	62	65	-3	3	_
Total	164	123	41	8	49

 Table 3.4.5. Improvement Plan of Maritime Safety Rescue Ships

Moorage-piers for Exclusive Use of Maritime Safety Rescue Ships It was necessary to construct new moorage-piers at Tanjung Priok, Surabaya and so on, where Class I-A and I-B maritime safety rescue ship were to be allocated. The size and location of new moorage-piers are shown in **Table 3.4.6**.

Table 3.4.6. Size and Location of New Moorage -piers

Class	Length (m)	Width (m)	Thickness	Newly Proposed Locations
			of Deck (m)	
I-A	95	6	0.25	Tg. Priok, Surabaya, Ujung
				Pandang
I-B	75	5	0.20	Tg, Uban, Belawan,
				Bitung, Ambon, Jayapura

Allocation of Aircraft

The optimum allocations of aircraft are shown in Table 3.4.7.

Туре	KANWIL	DGSC Air	Airport	No. of
		Station		Aircraft
Airplane	III	Jakarta	Jakarta	2
	VI	Ujung	Ujung	2
		Pandang	Pandang	
		Sub Total		4
Helicopter	Ι	Medan	Medan	2
	II	Tg. Uban	Tg. Uban	2
	III	Jakarta	Jakarta	2
	IV	Surabaya	Surabaya	2
	VI	Ujung	Ujung	2
		Pandang	Pandang	
	VIII	Ambon	Ambon	2
		Sub Total		1 2
		Grand Total		16

Table 3.4.7. Number and Allocation of Aircraft

Special Rescue Team

Special Rescue Teams were to be formed to carry out special tasks as given below.

- a. To rescue vessels carrying dangerous cargoes such as high pressure gas, toxic substances;
- b. To rescue crews of capsized or sunken vessels by utilizing skilled scuba diving techniques;
- c. To send specially trained rescue teams by helicopter to scenes where maritime safety rescue ships can not approach.

Ship Reporting System

In Indonesia, the ship reporting system may be implemented through the joint use of the SAR information networks, Message Exchange System and Management Information System.

(2) Marine Disaster Prevention

Allocation of On-shore Bases

In addition to the allocation of important bases for maritime safety rescue ships, on-shore bases for the disposition of marine disaster prevention units should be allocated with consideration given to location of marine accidents.

Under the above conditions, on-shore bases for marine disaster prevention units should be located at the following nine ports; Belawan, Tg. Uban, Tg. Priok, Palembang, Surabaya (Tg. Perak), Cilacap, Balikpapan, Ujung Pandang and Bitung.

Marine Disaster Prevention Units

It was advisable to establish Marine Disaster Prevention Units at each base, under KPLP units, which was to be deployed for real time operations.

Each of the Maritime Disaster Prevention Units consists of:

a. Maritime safety rescue ship: 1 vessel

b. Equipment and Materials

Foam concentrate:	2 kiloliters
Chemical dispersant:	70 kiloliters
Dry chemical powder:	2 tons
 Fire-fighting devices: 	30 sets
• Safety devices for dangerous chemicals	3 sets
Gas indicator:	2 sets
• Oil boom:	1.800 m
• Oil skimmer: 100 kilolit/hr x 1 set, 30 kil	lolit/hr x 1 set

• Handy oil recovery devices: 10 sets

(3) Maritime Safety and, SAR Communications and Information System Establishment of Maritime SAR Telecommunications System

- Establishment of COSPAS / SARSAT LUT
- Establishment of A1 Areas = VHF DSC Communication Facilities
- Establishment of A2 Areas = MF DSC/NBDP Communication Facilities
- Establishment of A3 Areas
- Establishment of NAVTEX

Establishment of Maritime SAR Information Networks

- Establishment of trunk line networks utilizing PALAPA satellite transponders
- Establishment of area information networks
- Network links with new establishment proposed
- Improvement of Tg. Uban Radio Station
- Establishment of aeronautical communications
- Establishment of marine radio direct telephone system

Establishment of Command and Control Communications System including Ship-reporting System

- Establishment of Message Exchange System (MES)
- Management Information System (MIS)

- Area Communications Terminals
- Ship Reporting System
- (4) Harbour Traffic Control System

A Traffic Control Center was to be established at each port of Surabaya, Belawan and Jakarta (Tg. Priok).

- (5) Education and Training System for Maritime Safety and SAR Personnel Establishment of DGSC Academy was proposed to secure maritime safety personnel in order to keep high level of knowledge and experience in SAR activities, maritime traffic safety, environmental protection, radio communications and aids to navigation.
- (6) Maritime Safety and SAR Organizational System

The suggestion and advice on the establishment of sub-organizations were made specifically referring to the maritime safety-related three Directorates of Sea and Coast Guard, Navigation and Maritime Safety as well as the KANWILs and local operation units.

3.5. "Feasibility Study on Vessel Traffic Management Services" Issued in June 1998 by France

3.5.1. General

The French Government grants this "Feasibility Study on Vessel Traffic Management Services" to Indonesia for the management of navigating vessels inside Archipelagic sea lanes.

In June 1998, the IMO approved the three (3) sea lanes that are designated as follows:

- (1) Sea Lane : Sunda strait, Jawa sea, Kalimata strait to South China Sea
- (2) Sea Lane : Lombok strait, Makassar Strait to Celebes Sea.
- (3) Sea Lane : Incoming route from Indian sea and Arafura Sea to Celebes Sea and Pacific Ocean through Banda and Mukluk sea.

This Study Plan was carried out to study the feasibility of the project to attain the following main objectives for Sea Lane and . The Sea Lane is not included in this feasibility study. Main objectives of this project are:

- (1) Ensuring of safe navigation for every ship inside sea-lanes.
- (2) Management of navigation of every vessel that is sailing inside the sea lanes at a normal speed.

To attain the foresaid objectives, the project is proposed as follows:

- (1) Addition and relocation of Aids to Navigation (Lighthouse, Light beacon, Buoys and Racons).
- (2) Establishment of VTS system comprised of Radar, VHF Radio, Satellite communication link, Operator Console and Engine generator.

When this project has been completed, the system could help the DGSC in the following aspects:

- (1) Performance of real time traffic survey.
- (2) Establishment of TSS in narrow channels of the sea-lanes.
- (3) Establishment of regulations, laws and others for safety navigation in the sea lanes.

3.5.2. Sites of the Project

The project sites will be located as follows:



Figure 3.5.1. Project Sites for Feasibility Study for VTS.

The Radar, VHF radio and Satellite communication sub-system are installed at each sites excluding Jakarta center site. Operator console with data signal processor is installed to manage the vessels' navigation inside the sea lanes. Satellite communication sub-systems are provided to communicate between Jakarta center and other sites.

3.5.3. Description of the Project

(1) Name of Project:	Feasibility Study on Vessel Traffic
	Management Services for Strategic sea lanes
(2) Source of fund:	Grant by Government of France through FF.
(3) Targeted Project Area:	Sea-lane 1 and 2
(4) Budget:	FF 4.000.000

(5) Component of the project:

The project comprises of two (2) main works as follows:

Addition of Aids to Navigation

The DGSC has Aids to Navigation along the sea lanes by 1998 as follows:

	Sea Lane	Sea Lane	Total			
Lighthouse	9	13	22			
Light Beacon	11	2	13			
Racon	3	1	4			
Total	23	16	39			

Table 3.5.1. Aids to Navigation owned by DGSC

The French consultant recommended the additional Aids to Navigation as follows:

FICHTH CONSULTANT.						
	Sea Lane	Sea Lane	Total			
Lighthouse	5	2	7			
Light Beacon	10	1	11			
Racon	2	0	2			
Buoys	1	0	1			
Total	18	3	21			

Table 3.5.2. A dditional Aids to Navigation Recommended by French Consultant.

Some of the recommended Aids to Navigation by French consultant are installed for Sea Lane and by German Project are as follows:

Table 3.5.3. Aids to Navigation Installed by German Project.

	Ŭ		V
	Sea Lane	Sea Lane	Total
Lighthouse	3	2	5
Light Beacon	5	1	6
Total	8	3	11

Establishment of VTS system

The proposed VTS system comprises of radar sub-system, VHF communication sub-system, Multiplex Radio Link sub-system, Satellite communication sub-system and Center sub-system. Civil works are required to construct the equipment house, Radar tower, Access road to the Site, Landing pier and others. The detailed sub-system and equipment proposed as follows:

			Sea-lane 1		Sea-lane 2		
VTS Equ	ipment	Sunda Kalimantan Natuna Lombok Makassar			Total		
Radar	Long range		1	1	1	2	5
Nauai	Medium range	2				1	1
VHF ra	dio	2	2	2	2	6	14
Satellit	e communication	1	1	1	1	3	7
sub-syst	tem (VSAT)	I	1	1	1	5	7
Center	sub-system	Jakarta					
Satellit	e communication	1					1
sub-syst	tem (VSAT)	1					I
Radar d	ata processing	2	1	1	1	3	8
Supervi	sor Work Station		1			1	2
Operato	or Work Station	1	1	1	1	3	7
Radio O	perator Position	1	1	1	1	3	7
Relay and Training Position		1				1	
Mainter	nance Work Station			1			1

Table 3.5.4. The Detailed Sub-system and Equipment Proposed

(6) System architecture

The eight (8) radar VTS sites are located nation widely. One (1) Center site is located at Jakarta DKI. The Jakarta Center communicates with eight (8) VTS sites by Satellite communication link to transfer radar image. Instruction to vessels is also given by voice through satellite communication link. Detailed system architecture is as follows:



Figure 3.5.2. System Architecture

(7) Civil Works

The eight (8) radar VTS sites are located in isolated areas because of technical requirement to attain the objectives of the project. Most sites are located on tops of the mountains of isolated islands, so that equipment houses and access roads shall be constructed. Landing piers should be also constructed to transport materials to small islands having few inhabitant. For each site, civil works are summarized as follows:

Site Name	Province	Altitude (m)	Tower Height (m)	Access road (km)	Landing pier (m)	Leveling of site (m²)	Equipment house
Tanjung Lesung	Jawa Barat	130	35	3.5	0	1,188	1 set (approx.50m²)
Panjurit island	Lunpung	91	20	1.1	40	1,188	1 set (approx.50m²)
Sarutu island	West Kalimantan	425	35	5.5	40	1,188	1 set (approx.50m²)
Natuna island	North West Kalimantan	600	20	6.0	40	1,188	1 set (approx.50m²)
Lombok strait	Nusa Tenggara Barat	500	20	5.4	0	1,188	1 set (approx.50m²)
South Makassar	South Sulawesi	0	35	0.2	40	1,188	1 set (approx.50m²)
Central Makassar	Couth Sulawesi	385	35	5.0	0	1,188	1 set (approx.50m²)
North Makassar	Central Sulawesi	310	35	3.5	0	1,188	1 set (approx.50m²)

Table 3.5.5. Summarized Civil Works of Each Project Sites .

(8) Operation, Maintenance and Staff

Operation and Maintenance

One management group is proposed to manage vessels navigating in the sea-lanes by VTS system. The organization for operation and maintenance of VTS system is shown as follows. The skilled sixty-seven (67) Staffs are required to operate and maintain this VTS system for 24 hours operation.



Figure 3.5.3. Organization of Operation and Maintenance.

Detail of the skilled staffs is as follows:

- Center Chief: 1 person
- Deputy: 1 person
- Maintenance: 2 person
- Supervisor and Operator:

	Nos. of	Staffs for	Nos. of	Backup	Total Staffs
	Terminal	one group	shift	Staffs	
Supervisor	2	2	3	2	14

Table 3.5.6. Detail of Skilled Staffs

Training for operation and maintenance

Various kind of knowledge is required to manage vessels navigating in the sea-lanes for staffs of VTS management group. Three (3) kinds of training courses are proposed for the training of Supervisors/operators. Those are classroom training, practical training and On-the-Job training.

- a.Classroom training includes general items related to maritime regulations of sea-lanes, VTS concepts, IALA Guideline, operation procedure of radar and etc.
- b. Practical training will be given to trainees to familiarize actual operation of radar and VHF radio equipment including man-machine interface. This course may be performed with simulator.

c. On-the-Job training will be given to trainees to familiarize actual real time operation at each facility.

(9) Implementation schedule

The project is proposed to be implemented in two phases. Each phase consists of the following items:

Phase-1:

- a. Sunda strait for Sea Lane as a strategic input/out,
- b. Kalimata strait for Sea Lane as hazardous sea area,
- c. Central Makassar for Sea Lane as sea area closed to seashore,
- d. Jakarta Traffic Center.

Phase-2:

- a. Natuna island area for Sea Lane
- b. South and North Makassar areas, to complete traffic management in Sea Lane in hazardous areas and in input-output area, and
- c. Additional equipment for Jakarta Traffic Center.

(10) Project cost

Summary of estimated project cost and recurrent cost is proposed as follows:

Table	3.5.7. Equipment and Installation	Cost
	Including Civil Work Cost	

Unit:	Thousand	US\$
-------	----------	------

	Phase-1	Phase-2	Total
Procurement of Equipment	19,066	10,343	29,409
Equipment setting up	2,131	1,373	3,504
Spare parts	1,464	496	1,960
Civil works	1,830	863	2,693
Training	745	261	1,006
Engineering	2,092	850	2,942
Total investment cost	27,328	14,186	41,514

Uliit. Tiibusallu USş			
	Phase-1	Phase-2	Total
Operation and Maintenance cost (1 year)	732	366	1,098
Replacement of Major parts of equipment (5 years)	130	52	182

Table 3.5.8. Recurrent Cost

Note) This estimated cost includes foreign and local cost. Local cost is converted to US Dollar (US\$).

3.5.4. Present Status of the Project

Final report of this Feasibility Study was submitted on June 1998 to DGSC. This report proposes one project that has two kinds of works as follows:

- One is additional work of Aids to navigation for Sea Lane and ,
- Other is implementation of VTS system.

German Project realizes some of Aids to Navigation proposed by this report. In the other hand, the result of this feasibility study for implementation work of VTS system is reported to MOC to secure budget. This work has not yet been realized until now.

3.6. "Special Assistance for Project Sustainability for Maritime SAR Telecommunication System Project "in March 2000 by JBIC

3.6.1. Background

Along with the Report for "The Study on Maritime Safety Plan concerning Search and Rescue" issued in February 1989 by JICA, DGSC implemented "Maritime SAR Telecommunication System Project (Project' hereinafter)" and completed it in March 1992.

Telecommunication system for maritime search and rescue in Indonesia has been improved by the Project, but after several years of the Project's completion, the system was not fully functioning due to the following reasons:

(1) Reflecting the adverse economic conditions in Indonesia in these years, the following difficulties have appeared mainly due to lack of budgets:

Procurement of replacing parts such as modules and units is impossible. Technical training of officials from all over the country is not available. Costs of the relocation of communications equipment to be made at the same time of relocation of offices could not be secured.

- (2) It has become difficult to obtain maintenance goods because some equipment has been obsolete along with the rapid advance of electronic technology.
- (3) The maintenance of the equipment installed at the offices in remote areas could not be fully made because of difficulty of securing the required engineers and the means of transportation.

3.6.2. Objective and Outline of the Study

The Special Assistance for Project Sustainability (SAPS) program of the Japan Bank for International Cooperation (JBIC), is a grant assistance scheme designed to ensure the maximum possible attainment of the intended benefits of projects financed by JBIC and enhancement of their sustainability.

Under the SAPS program, JBIC SAPS team was formed to address the points relating to the improvement of proper implementation of the Project and recommended measures for enhancing the sustainability of the Project.

The study and analysis of the present status of the Project was made based on the field survey where the telecommunications equipment and facilities were installed. In addition, the present status of the maritime search and rescue

operation as well as the recent marine traffic conditions at the coastal waters of Indonesia including shipping accidents, piracy and armed robbery against ships were analyzed in order to make relevant solutions to those problem from a wide viewpoint based on the current circumstances. The following items were studied and analyzed:

(1) Shipping Accidents

- Maritime Search & Rescue System and Operation Maritime SAR Organization Distress Information Collection and Dissemination System SAR Vessels and Aircraft Maritime SAR Operation
- (3) Maritime SAR Telecommunication Network Present Status and Tasks Constructed Communication Network
 Outline of Study Results
 Review of Problems
 Study of Functional Rehabilitation

3.6.3. Recommendation proposed by the JBIC SAPS Team

Taking into consideration the present status of the maritime SAR telecommunication system and the maritime SAR operation including the recent trend of marine traffic in Indonesian waters, the SAPS team recommended the following subjects to be developed urgently;

- (1) Implementation of GMDSS in the Entire Sea Area of Indonesia.
- (2) Reinforcement of Traffic Safety and Surveillance System by VTS/AIS System for the Malacca Straits.
- (3) Functional Rehabilitation of the Maritime SAR Telecommunication Network
- (4) Enhanced Performance and Optimum Deployment of Rescue Vessels
- (5) Reinforcement of Maintenance System for the Telecommunication System
- (6) Improvement of Command Ability for SAR Operation at DGSC.

3.7. "Basic Design Study Report on the Project for Rehabilitation for Medium Wave Radio Beacon Stations in the Republic of Indonesia" (Nov. 2000)

3.7.1. General

Eighteen (18) Medium Wave Radio Beacon (MFB) Stations were established by Japan's Yen Loan of 1982 fiscal year in order to secure navigation safety and promote efficiency of sea traffic in the waters with large traffic volume in Indonesia.

However, most MFB stations had almost stopped their operation by 1996. Major reasons were failures of power supply system. They were not recovered because of weak management and maintenance system including a lack of budget for operation and maintenance. In addition, complex factors such as difficult accesses to the sites, lightning attacks, salty wind and rain. It could not be estimated at the time of planning construction.

In connection with the MFB stations, the International Maritime Organization (IMO) and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) have a concept to introduce Differential GPS (DGPS) for the improvement of ship positioning accuracy as a global system.

Many of the MFB stations in the world were changed to DGPS stations, and exclusive MFB stations without DGPS have been closed.

Some DGPS stations have been operated by the neighboring countries of Indonesia in Malacca and Singapore Straits and the waters around. Singapore operates one (1) station, Malaysia operates two (2) stations and India operates one (1) station at least around the straits.

On the other hand, Indonesia has established three (3) strategic sea lanes, that is, Sea Lane , Sea Lane and Sea Lane around Sunda Strait, Lombok Strait and other waters respectively.

Indonesia has approved that foreign warships and other vessels can freely navigate in the sea-lanes as parts of Indonesian waters since 1998.

The extension of the Traffic Separation Scheme (TSS) and the introduction of Ship Reporting System at Malacca Singapore Strait were decided.

Based on these points, Indonesia has been stressing the policies as a maritime country.

Under these circumstances, the development of aids to navigation facilities, which is the basis of securing navigation safety, has become important.

It was expected that the function of MFB stations, which is available for twenty-four (24) hours under all-weather condition, would be voluntarily recovered by Indonesia.

However, it became difficult to recover early the function of MFB station because of economy crisis of Indonesia.

Therefore, the Government of Indonesia (GOI) requested Japan's Grant Aids based on the Project for Rehabilitation for Medium Wave Radio Beacon Stations according to the international trend of IMO and so forth, to the Government of Japan on March 1999.

Based on the request of GOI, "Basic Design Study Report on the Project for Rehabilitation for Medium Wave Radio Beacon Stations in the Republic of Indonesia" (Report) was prepared by the JICA on November 2000.

The project areas covered by seven (7) stations in the project are faced to the most important waters. Those MFB stations to be rehabilitated in the project are to be re-located and co-sited with the existing Coastal Radio Station in order to secure proper operation and maintenance.

3.7.2. Outline of the Project

(1) New sites of MFB stations to be appropriate for implementation of the project.

Examination on the management system of seven (7) sites of coast radio stations and the competent District of Navigation Offices had been carried out in the study.

As a result of examination, it had been judged that the DGPS personnel necessary for the Project were available at these stations.

The natural conditions at these sites had no problem in operating the system in a continuous and stable manner.

The effective coverage of the DGPS system at each site includes the main commercial ports and port areas.

In particular, the DGPS stations planned at Jakarta and Benoa and so forth cover the important international straits and the sea-lanes established by Indonesia.

Therefore, the seven (7) sites shown in **Table 3.7.1**. and **Figure 3.7.1**. had been judged to be appropriate for implementation of the Project.

DGPS Station	Coastal radio Station	Latitude	Longuitude
Jakarta	Jakarta (TX station)	S 06 ° 07' 08"	E 106 ° 51' 47"
Semarang	Semarang (TX station)	S 06 ° 58' 34"	E 110 ° 20' 35"
Benoa	Benoa	S 08 ° 44' 35"	E 115 ° 12' 34"
Makassar	Makassar (TX station)	S 05 ° 06' 22"	E 119 ° 26' 31"
Balikpapan	Balikpapan (TX station)	S 01 ° 16' 12"	E 116 ° 48' 32"
Banjarmasin	Banjarmasin (TX station)	S 03 ° 18' 09"	E 114 ° 34' 38"
Pontianak	Pontianak	S 00 ° 01' 16"	E 109 ° 19'02"

 Table 3.7.1. Site Location of DGPS Stations





(2) Operation and Maintenance Management System

In the Project for rehabilitation of the existing MFB stations, the study of project sustainability had been implemented as one of the most important issues.

As a result, the Indonesian counterpart explained that the plan of raising

the fund for the operation and maintenance costs for the aids to navigation-related facilities from the Light Dues enforced in June 2000.

For the operation and maintenance system, the Plan of DGPS Operation and Maintenance System as shown in **Figure 3.7.2**. had been drafted.

In this plan, the DGPS Managing Group having overall responsibility for the operation and maintenance of the system would be established in DGSC, MOC and at least two dedicated maintenance technicians would be assigned to each DGPS station.

Therefore, it was deemed that the continuous and stable operation and maintenance of the system would be secured.



Figure 3.7.2. DGPS Operation and Maintenance System Plan

(3) Possibility of Reusing Equipment and Facilities of Existing MFB Stations It was planned to install a DGPS station at each of seven (7) coast radio stations. The study on whether or not some of the equipment and facilities at the existing MFB stations could be reused was made especially for transmitting antennas and engine generators.

As a result, it was made clear that no equipment and facilities could be reused for the Project for the following reasons:

Maintenance such as coating and change of Guy wires had never been made for the transmitting antennas since their construction, so that it would be very difficult to reuse these antennas for the next ten (10) years or more. The engine generators do not meet the requirements of necessary power capacity for the project and could not be reused in the project.

(4) Study of Frequency Allocation in Redeployment of Rehabilitated Stations Seven (7) stations to be rehabilitated would be re-deployed to expand their effective coverage.

It is necessary to coordinate various problems, including interference with the existing MF aeronautical beacon stations, with the frequency authority concerned before implementation of the project.

(5) Measures against Lightning Troubles

It is difficult to take absolutely secure measures against lightning, but it is required to take some adequate measures for new antennas and other equipment to be installed in the project.

(6) Baseline Analysis

The coordinates of two reference points (point A and point B) within the project sites had been made by Baseline Analysis to determine the base points for the system.

The reference points decided in the Report are shown in **Table 3.7.2**.

Datum	:	WGS-84

Station	Analysis Points	Latitude	Longitude
Jakarta	А	S 06 ° 07 08.19820	E 106 ° 51 47.66374
	В	S 06 ° 07 08.32962	E 106 ° 51 47.25311
Semarang	А	S 06 ° 58 34.96703	E 110°20 34.57313
	В	S 06 ° 58 35.15373	E 110 ° 20 35.92469
Benoa	А	S 08°44 35.47796	E 115°12 35.15003
	В	S 08 ° 44 36.24779	E 115°12 34.96632
Makassar	А	S 05 ° 06 22.84262	E 119°26 31.75777
	В	S 05 ° 06 21.59272	E 119°26 32.26951
Balikpapan	А	S 01 ° 16 12.36637	E 116°48 32.02178
	В	S 01 ° 16 12.59811	E 116°48 31.70571
Banjarmasin	А	S 03°18 09.31199	E 114 ° 34 38.49799
-	В	S 03°18 08.78100	E 114°34 37.80763
Pontianak	А	S 00 ° 01 16.72827	E 109°19 02.57480
	В	S 00 ° 01 16.37295	E 109°19 04.10474
(7) Design concept

Consideration for Environmental Conditions

- a. The adequate operational temperature range indoor and outdoor for equipment, waterproof mechanism, wind load, and seismic factor had been considered in the Report for the procurement of equipment and materials in the light of the environmental conditions in Indonesia.
- b. The PC and its peripheral apparatus were complied with standard temperature specification that was applied usually in market.

Measures for ability of Operation and Maintenance by the executing Agency

It had been agreed in the study in the Report that;

- a. Immediately after the signing of the Exchange of Notes (E/N) on the Project under the Japan's Grant Aid, the DGPS Managing Group would be newly established in DGSC to manage and control the DGPS system.
- b. Training course for maintenance engineers had been postponed for three
 (3) years because of lack of budget. The resumption of training course was advised in DGSC to upgrade skills and maintains technical level of engineers.
- c. Maintenance engineers for DGPS Station were advised to upgrade their skills through training given by JICA and OJT that would be done by manufacturers.

Scope of Construction and Equipment, Setting of grade

- a. The project provided no construction work because space for equipment was available by re-allocation of equipment or furniture at each existing coastal radio station.
- b. The DGPS system required high-grade (high reliability) equipment in order to offer high accuracy positioning information, even under severe environmental condition, for vessels to navigate safely in the coastal waters of Indonesia.

The Implementation schedule

- a. In case the Project was carried out under the Japan's Grant Aid, the Project shall be completed usually within a fiscal year.
- b. The fifteen-(15) months of implementation period were required from contract to complete the Project.

(8) Outline of the planned DGPS system in Indonesia

The DGPS system and its main equipment in Indonesia planned in the

Report is shown in **Figure 3.7.3**. and **Table 3.7.3**. respectively.



Figure 3.7.3. DGPS System in Indonesia

Table 3.7.3. Allocation Plan of Main Equipment

Main Equipment	JKT	SIMG	BNA	JPG	BPN	MU	TR	MG
1. DGPS Transmitting System								
(1) Transmitting Antenna	0	0	0	0	0	0	0	
(2) Antenna Matching Unit	0	0	0	0	0	0	0	
(3) Antenna tower	0	0	0	0	0	0	0	
(4) MF Transmitter	0	0	0	0	0	0	0	
(5) DGPS Monitor/Control	0	0	0	0	0	0	0	
(6) Software for (5) above.	0	0	0	0	0	0	0	
2. DGPS Monitoring System		s				2		
(1) Data Processing Equipment								0
(2)Data Comm./transfer Equip.	0	0	0	0	0	0	0	
(3) Software for (2) above.	0	0	0	0	0	0	0	
3. Power supply system								
(1) Engine Generator			0	0]	0	
(2) Isolation transformer			0		0	0	0	
(3) Automatic Voltage Regulator			0		0	0	0	
(4) Step-up/down	0			0	0	0		
4. Interference Protection Equipment			0				0	
5. Associated facility								
(1) Anti-lightning facility		0	0				0	
(2) Air conditioner			0	0	0			
6. Operation & Maintenance Equipment	0	0	0	0	0	0	0	
7. Spares	0	0	0	0	0	0	0	0

Power supply system and Backup for system

- a. The existing power supply system has been utilized as far as possible subject to stable operation and maintenance for coming ten (10) years.
- b. The un-interrupted Power Supply (UPS) with batteries was adopted at the minimum for important part such as personal computer (PC) that controls and monitors DGPS system.
- c. The supporting time duration by UPS is designed for twenty (20) minutes at most because the output of engine generator (E/G) system would be established within ten (10) minutes after commercial power is off.

3.7.3. Operation and Maintenance Cost of DGPS Stations

The operation and maintenance cost of DGPS stations in Indonesia to be operated by DGSC after the completion of the project has been estimated as shown in **Table 3.7.4**.

 Table 3.7.4. Operation and Maintenance Cost of DGPS Stations

 Unit: Thousand Rupiah

	Item	Amount
1.	Personnel expenses	175,200
	(1) DGPS managing group	57,600
	(2) DGPS stations	117,600
2.	Operation and maintenance cost	335,243
3.	Traveling cost	30,620
	Total	541,063

The light dues newly introduced in year of 2000 have been strongly expected for operation and maintenance for aids to navigation and their related matters in the future.

Also, the light dues would provide the operation and maintenance cost for the DGPS system except the personnel expenses mentioned above.

3.7.4. Suspension of Implementation of the Project

This project has been suspended for the following reasons:

(1) SA Termination

The US Administration announced hastily on May 1, 2000 to the users of Standard Positioning Services (SPS) that the Selective Availability (SA) intended for GPS positioning with a lower accuracy than that for military use was terminated at midnight on May 1, 2000.

As a result, the GPS positioning accuracy was globally enhanced around 10 times as high as before. In this connection, Inter-agency GPS Executive Board (IGEB) of the US Administration has declared that "Users in the US and the rest of the world should now be experiencing the same basic GPS accuracy of 10-20 meters or better.

The GPS positioning accuracy at the time of the request of Grant Aids of Indonesia, namely before the SA termination, was about 100m. By the SA termination, the GPS accuracy had been enhanced to around 10m. As a large change appeared in the background situation for the request of Indonesia.

(2) Confirmation of accuracy of GPS system

For the reasons of SA termination above mentioned, the precise discussion on the GPS positioning accuracy after SA termination should be made based on the measurement and analysis considering the following points:

Error measurement considering the model difference of GPS receivers, Error measurement for a long time considering seasonal changes, and Confirmation of static and dynamic accuracy.

The points and above were confirmed in the Study

The point on the error of seasonal changes above was confirmed and analyzed through the measurement of accuracy of GPS in **the Study**.

The result of analysis for the measurement of GPS accuracy in Indonesia is described in **Section 6.1. of Chapter 6**.

(3) Check on the conditions for introduction of light dues

For the light dues newly introduced to utilize for the operation and maintenance of aids to navigation services and their related matters, it was deemed to be necessary for the following points:

to check the conditions of the established system including the system of reporting on the light dues within the Indonesian Government; and to fully verify the light due amount and its distribution plan that had

to fully verify the light due amount and its distribution plan that had originally been estimated.

The points and above were confirmed in **the Study**. The result of the Study for the points above is described in **Chapter 4**.

3.7.5. Confirmation of Necessity of DGPS System

The study of GPS (including DGPS) needs was carried out to confirm the necessity of the DGPS system in Indonesia in the Study for the Maritime Traffic Safety System Development Plan in the Republic of Indonesia in this time.

The result of the study is described in Section 6.2. of Chapter 6.

3.8. "Navigational Safety Project in Indonesia" in June 2001 by German Bank

3.8.1. General

German loan project is on-going project including installation works engaged by the German Bank of Reconstruction (KfW), based on the Master Plan on the Development of Aids to Navigation System in the Republic of Indonesia, October 1985 with long-term plan up to year of 2000.

It was implemented in this project to establish 34 new lighthouses and light beacons at seven (7) District of Navigation Offices among the existing twenty-four (24) District of Navigation Offices (DISNAVs/Sub DISNAVs).

The project locations are allocated in the waters around three international Sea Lanes of , and as shown in **Figure 3.8.1**.



Figure 3.8.1. Location Map of Navigation Safety Project in Indonesia

The main target of this project is to improve the safety of maritime traffic and to fulfill the obligations with respect to international conventions and regulations; e.g. of the International Maritime Organization (IMO) and International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA).

3.8.2. Project Description

The aids to navigation including supporting facilities to be developed in this project are as follows;

(1) Name of project : Navigational Safety Project in Indonesia
(2) Source of fund : Provided by the Government of Germany through KfW
(3) Loan agreement : No. 1999 65 450 (Loan amount: 42 million DM)
(4) Project Period : Within 18 months after the day of issuance of
Notice to Proceed.
(5) Project type : Tied loan including installation works
(6) Composition
Lighthouse : 11 units (40m galvanized steel lattice tower)
Light beacon : 10 units (30m galvanized steel lattice tower)
Light beacon : 5 units (20m galvanized steel lattice tower)
Light beacon : 8 units (10m galvanized steel lattice tower)
Light buoy : 119 units
Workshop equipment : 5 units
Remote control equipment : 3 locations
On-the-job and factory training : 1 lot

(7) Project area for this project:

There are seven (7) project areas of the District of Navigation Offices, which are six (6) DISNAVs of Tanjung Pinang, Benoa, Tanjung Priok, Makassar, Manado/Bitung, Kupan, Ambon and one (1) Sub DISNAV of Pontianak.

3.8.3. Project Locations

The lighthouses and light beacons are located in remote areas around three (3) strategic sea lanes. They are mainly erected on small islands, which not always have a landing facility. Three towers are erected off shore on concrete platforms.

The detail of locations is given in Table 3.8.1.

The positions and time of positioning of the 119 buoys are not yet finally determined. For the time being they will be stored on the buoy base in

DISNAV Tg. Priok. The distribution of lighted buoys is given in **Table 3.8.2**.

The workshop equipment, which was fabricated in Germany, is installed in the workshops of five (5) different DISNAVs/Sub DISNAVs that are DISNAV Tanjung Pinang, DISNAV Benoa, Sub DISNAV Pontianak, DISNAV Tanjung Priok and DISNAV Ambon.

Main Equipment to be supplied for this project is given in **Table 3.8.3**.

Two (2) light beacons and one (1) light buoy are equipped with remote control equipment for a remote control by ORBCOMM satellite system via Internet communication from the central station at DISNAV Tanjung Pinang. The site locations mentioned above are shown in **Figure 3.8.1**.

The fixed stations are Kg. Jackson offshore light beacon, and LAP 1955 offshore light beacon. The floating location is a light buoy of the DISNAV Tanjung Pinang.

No.	Name	Latitude	Longuitude	Location	DISNAV
S	ea Lane				
1	P.Pejantan	N 00°06 08	E 107°13 56	Natuna Sea	Pontianak
2	P.Anakawur	N 00°33 24	E 106°58 30	Natuna Sea	Pontianak
3	P.Tokong Kemudi	N 00°55 15	E 106°44 30	Natuna Sea	Tg.Pinang
4	P.Seraya	N 02°41 05	E 108°34 10	Natuna Sea	Tg.Pinang
5	Lap 1955	N 02°57 59	E 108°14 43	Natuna Sea	Tg.Pinang
6	Kr.Jackson	N 02°58 25	E 107°54 26	Natuna Sea	Tg.Pinang
7	Tg.Waton	S 06°36 46	E 105°06 02	Sunda sea	Tg.Priok
8	P.Rakat	S 06°09 41	E 105°27 27	Sunda sea	Tg.Priok
S	ea Lane				
1	Tg.Pandanan	S 08°43 17	E 115°51 11	Isle of	Benoa
2	TgBinanga	S 03°20 18	E 118°50 41	Isle of Sulawesi	Makassar
3	Tg.Ongkona	S 03°05 34	E 118°46 35	Isle of Sulawesi	Makassar
S	ea Lane				
1	P.Makian	N 00°19 52	E 127°20 41	Maluku sea	Ambon
2	P.Hiri	N 00°53 54	E 127°18 15	Maluku sea	Ambon
3	Tg.Babo	N 01°02 34	E 127°24 03	Maluku sea	Ambon
4	P.Sidanga	N 01°39 50	E 127°28 53	Maluku sea	Ambon
5	Tg.Sopi	N 02°38 39	E 128°33 55	Maluku sea	Ambon
6	Tg.Mayu	N 01°19 39	E 126°24 53	Maluku sea	Ambon
S	ea Lane A				
1	P.Mananomi	S 08°08 57	E 125°05 37	Ombai sea	Kupan
2	Tg.Atadai	S 08°33 38	E 123°33 25	Ombai sea	Kupan
3	Tg.Koyiek	S 08°24 04	E 124°45 18	Ombai sea	Kupan
4	P.Batek	S 09°15 24	E 123°59 35	Ombai sea	Kupan
5	Tg.Gemuk	S 09°29 31	E 123°47 43	Ombai sea	Kupan
6	TgLiegeta	S 10°31 28	E 121°58 52	Sawu sea	Kupan
7	P.Raijua	S 10°37 55	E 121°31 15	Sawu sea	Kupan
8	P.Dao Besar	S 10°48 07	E 122°39 08	Sawu sea	Kupan
9	P.Dana	S 11°00 04	E 122°53 02	Sawu sea	Kupan
S	ea Lane B				
1	P.Bartutui	S 03°54 12	E 127°12 48	Banda sea	Ambon
2	Tg.Ngunju	S 10°19 06	E 120°27 17	Banda sea	Kupan
3	Tutunmahin	S 08°06 05	E 127°13 39	Wetar strait	Kupan
4	Tutunhatuloi/ Tutunlatubi	S 07°39 24	E 126°48 38	Wetar strait	Kupan
S	ea Lane C				
1	P.Kalbur	S 06°39 14	E 131°35 24	Banda sea	Ambon
2	Tg.Warlangier	S 06°59 16	E 132°00 25	Banda sea	Ambon
3	P.dumarehe	N 04°13 39	E 125°42 03	Wulawesi sea	Bitung
4	P.Kemboling	N 04°38 59	E 125°26 01	Wulawesi sea	Bitung

Table 3.8.1. Location of Lighthouses and Light Beaconsin Navigational S afety Project in Indonesia

					Ту	pe of Buoy				
NI.	Name of DISNAV/Sub DISNAV	Teterral	Isol	ated	Safe	Cardinal	Cardinal	Cardinal	Cardinal	4-4-1
INO.		Lateral	denge	r Mark	Water	North	East	South	West	total
		магк		Sea Lane	Mark	Sea Lane	Sea Lane	Sea Lane	Sea Lane	
1	Sabang									
2	Belawan	8	1		1					10
3	Sibolga									
4	Dumai	14	2		2					18
5	Tg.Pinang	8	2		2					12
6	Tlk.Bayaur									
7	Palembang	4	1		1					6
0	Ta Prick	10	3		2					15
0	I g. F Flok			9		1		1	1	12
9	Semarang	4								4
10	Cilacap									
11	Surabaya	8	2		2					12
12	Benoa	2								2
13	Pontianak	2			2					4
14	Banjarmasin	5			2					7
15	Samarinada	4	1		1					6
16	Tarakan									
17	Manado/Bitung									
18	Kendari									
10	Makagan(uin)	2								2
19	Makassar(ujp)			2			1			3
20	Kupan									
21	Ambon									
22	Jayapura									
23	Sorong	6								6
24	Merauke									
	total	77	12	11	15	1	1	1	1	119

Table 3.8.2. Distribution of Light Buoy in Navigational Safety Project in Indonesia

No.	Equipment	Main Specification	Quantity
A.N	Aachinery	·	
1	Lathe Machine	2000 x 250 mm	1 unit
2	Universal Milling Machine	270 x 1350 mm	1 unit
3	Bench Grinding Machine	180 mm,3000rpm	1 unit
4	Vertical Drilling Machine	min. 25 mm	1 unit
5	Bench Drilling Machine	min. 18 mm	1 unit
6	Hack Saw	240 - 400 mm	1 unit
7	Electro-Hydraulic Pipe Bender	up to 100 mm	1 unit
B . V	Vood Work Machine		
1	Table Circular Saw	up to 100 mm , 2800 rpm	1 unit
2	Wood Milling Machine	h 230mm /w 400mm /d 5mm	1 unit
C. W	elding Machinery		-
1	Mobile Welding Generator	20 kVA	1 unit
2	Welding Transformer	16kVA, 260 A	1 unit
3	Oxygen/Acetylene Welding	Complete cutting and welding	1 unit
D . Air Compressor, Height Pressure Water Jet, Equipment			
E.E	Electric Hand tools		1set
F . N	Iechanical Bench Tools		1set
G . N	<u>/lechanical Testing / Measuring I</u>	Equipment	1set
H.E	<u> Electric / Electronic Equipment / </u>	Tools and Measuring Devices	1set
I.Li	ifting Devices and Transport Equ	<u>iipment</u>	
1	Traveling Unit Geared Trolley	min 5000 kg	1 unit
2	Cain Hoist	0.5 - 3 Ton	6 unit
3	Hydraulic Jack	30 Ton	1 unit
4	Hydraulic Hand Pallet Car	2400 - 2600 kg	1 unit
5	Hydraulic Workshop Crane	900 - 1200 kg	1 unit
6	Forklift Truck	7 Ton at 600 mm	1 unit
J . G	enerator		-
1	Mobile Generator	30 kVA	1 unit
2	Diesel Generator	60 kVA	1 unit

Table 3.8.3. Workshop Equipment of Navigational Safety Project in Indonesia

3.9. Technical Co-operation in the Field of Maritime Safety Operation and the Information Technology in November 2001 by JICA

3.9.1. Background

In a few years, the problems of piracy and armed robbery to ships has become more serious in Indonesian waters, especially in the Strait of Malacca. In case of taking countermeasures to piracies, one of the most important issues is how to get information and deal it.

Considering this situation, the Government of Indonesia requested the Government of Japan to send short term experts in the field of maritime safety, operation, radio communication and computer network, especially in order to cope with rampant piracies in the Strait of Malacca and other sea around Indonesia.

3.9.2. Setting up Maritime Safety Information System

Responding to the above request, JICA dispatched three short term experts in the field of maritime safety, radio and computer from September 2001 to November in order to give technical co-operation such as setting up a computerized maritime safety information to DGSC.

The JICA experts set up Maritime Safety Information System (MSIS) based on personal computers and internet at the major DGSC district offices in the Strait of Malacca and Singapore, and DGSC headquarters in Jakarta in cooperation with DGSC counterparts.

After the installation of the system at each office, they gave training on the operation of the system to the officials in charge of maritime safety including anti-piracy.

MSIS enabled DGSC to exchange piracy information among Belawan, Dumai, Tanjung Uban, DGSC headquarters, International Maritime Bureau (IMB) Piracy Reporting Center, and other domestic and international security organizations.

MSIS is expected to be utilized not only for anti-piracy but also for other missions, such as maritime search and rescue, marine environment protection and disaster prevention.

The system is planned to be expanded to Tanjung Priok, Bitung, Ambon, Samarinda and other districts in the next stages.

CHAPTER 4.

COLLECTING SYSTEM OF LIGHT DUES

CHAPTER 4. COLLECTING SYSTEM OF LIGHT DUES

4.1. Background of Introduction of Light Dues

Main duties of DGSC are to carry out services related in versatile maritime safety fields based on the policies determined by Minister of Communications, Republic of Indonesia. DGSC has responsibilities for aids to navigation and maritime telecommunication services in maritime safety field.

In order that Indonesia may be able to fulfill its international responsibility as one of the signatories of the SOLAS Convention for keeping safety of navigation and promoting efficient maritime traffic in the Indonesian territorial waters, it is required to upgrade, in quality and quantity, infrastructure for safe navigation as follows;

- Aids to navigation,
- VTS,
- Maritime telecommunications,
- State ships and workshops for supporting operation and maintenance of aids to navigation, and
- Jetties and docks mainly to carry out operation and maintenance of state ships.

On the other hand, the routine budgetary situation in the Directorate of Navigation, DGSC from fiscal year 1998 to fiscal year 2002 except personnel expenses and traveling expenses is shown in **Table 4.1.1**.

Table 4.1.1. Operation and Maintenance Budget on Directorate ofNavigation

				Unit: M	Iillion Rupiah	
Item	1998/99	1999/00	2000	2001	2002	
Actual	24 970	24.970 29.220		22.225		
Budget	34,079	38,329	29,904	33,223		
Requested		100 200	61 449	50 225	02 207	
Budget		109,300	01,442	38,223	93,897	
Acquisition		25.079/	19 670/	57 069/		
Ratio		35.07%	48.07%	57.00%		

Data Source: DGSC, Fiscal Year 2000: April 1 to December 31

As shown in the current budge tary situation, it is scarcely expected to get budget for those purposes of DGSC from general account.

The actual budget from general account in 1999 was cut down to about 35% of requested budget since the economic crisis started in 1998.

Therefore, the light dues system was introduced in May 2000 and started collection in June 2000 to improve the budgetary situation for operation and maintenance of facilities as a special account for supplementary budget.

4.2. Outline of Light Dues

4.2.1. Light Dues

The light dues are one of non-taxation State Revenue consists of three kinds of charge for the following navigation services;

- Services of Marine Aids to Navigation,
- Rental services of navigation shipyard facilities, and
- Maritime telecommunication services.

4.2.2. Imposition of Light Dues

(1) Vessels to be applicable to the light dues

The light dues are imposed on the international sea transportation vessels, domestic sea transportation vessels and passenger vessels or pioneer vessels that are navigating in Indonesian waters.

It is calculated based on gross tonnage of a vessel, and collected from every vessel who calls at a sea port or special port or ferry port or the other prescribed location according to the related laws and regulations in Indonesia. The light dues, however, is not imposed on the following vessels:

- The vessel which only passes the Indonesia waters,
- The state vessel which is used for government duties,
- War ships,
- Hospital ships in war condition,
- Vessels of less than 35 gross tons,
- The vessel which enters a port requesting for help/rescue or the vessel which gives help/rescue to human life,
- The vessel which is on sea trial, and
- Private vessel which is on government duties.

(2) Tariffs of light dues

The following light dues are imposed on every vessel that conforms to Attachment No. II B of Government Regulation No. 14 in year 2000

concerning Tariffs on Non-taxation State Revenue that is currently valid in Ministry of Communications;

For the vessel of foreign flag	: US\$0.027 per gross ton
For the vessel of Indonesian flag	: Rp.200 per gross ton
For the traditional/ pioneer ship	: Rp.100 per gross ton

(3) Management of light dues

The light dues as Non-taxation State Revenue are required to be immediately deposited to government treasury and be managed in the system of National Revenue and Expenditure Budget.

4.3. How to Collect the Light Dues

The collection of light dues as Non-tax State Revenue is carried out according to the followings;

- (1) To be deposited directly to the State Cash Office immediately
- (2) To be managed in the State Budget System
- (3) To be deposited to State Cash Office by the service user or the receiving treasurer appointed by the Minister
- (4) To be collected and deposited by using a form as evidence.
- (5) To be a deposit form which is decided by the Minister of Finance
- (6) To be a form of receipt/debit note for collection which is decided by Director General
- (7) To be reported on receiving and depositing every one month at the latest on the 10^{th} of the next month.

The receiving, depositing, reporting and distribution of light dues are implemented as shown in **Figure 4.1**.

Figure 4.1. Flow Chart on Collecting System of Light Dues & its Distribution



4.4. How to Spend the Collected Light Dues 4.4.1. Scope of Utilizing Light Dues

The utilizing part of fund born from Non-taxation State Revenue (PNBP), i.e. light dues, which comes from revenue of navigation services at Directorate of Navigation, DGSC was permitted by Decree of Minister of Finance Republic of Indonesia, Number 306/KMK.06/2001 on May 17, 2001.

The light dues as revenue from navigation services can be re-utilized up to 50% at the same fiscal year to finance the following services:

- (1) Research and development in the field of navigation technology,
- (2) Upgrading of human resources in order to improve service quality to the public,
- (3) Law enforcement for keeping order, supervising, controlling and securing as well as maritime safety in Indonesian waters,

- (4) Investment relating to facilities and infrastructures for safe navigation such as facilities of marine aids to navigation, maritime telecommunication, state ships, workshops, piers and dockyards for services to the public, and
- (5) Maintenance and repair for office/building and other equipment relevant to navigation services.

There is a ceiling up to 50% for utilizing of light dues in the fiscal year 2001 because it was the first year for the procedures on the budgetary allocation for utilizing of light dues after light dues system was introduced. It is expected that the ceiling for utilizing of light dues will increase in the near future.

4.4.2. Actual Allocation on Utilizing of Light Dues

The actual allocation on utilizing of light dues in the fiscal year 2001 is shown in **Table 4.2**.

Table 4.2. Actual Allocation on Utilizing of Light Dues

	Unit. Thous	anu Rupian
Allocation Category	Amount	Ratio
Procurement for Operation	22,890,630	<u>43.54%</u>
• Office supply, communication fee, documentation	148,900	0.28%
• Equipment for Operation and Maintenance	6,787,493	12.91%
• Utilities (Light, Gas, Water, etc)	783,120	1.49%
• Indirect services	15,171,117	28.86%
Procurement for Maintenance	28,622,017	<u>54.44%</u>
 Maintenance for Office Building 	84,107	0.16%
• Maintenance for Minor Transportation Equipment	4,000	0.01%
• Maintenance for Aids to Navigation and Supporting		
Facilities, i.e.	28,533,910	54.27%
- Vessels for Aids to Navigation Services		
-Spares for Aids to Navigation & Supporting		
Facilities and Coastal Radio Stations		
- Fuel supply for Vessels, and so forth		
Others	1,063,204	2.02%
• Human Resources	229,200	0.43%
• Traveling	834,004	1.59%
Total Amount	52,575,851	100%

Data Source: DGSC

The actual allocation of budget from the light dues was approved by Ministry of Communications and Telecommunications at the end of August 2001 through sufficient approval procedures and time because it was the first time for Indonesia to officially utilize the light dues. The budget from light dues in the fiscal year 2001 can be utilized during the period from September 2001 to December 2001.

The allocation ratio of the procurement of equipment for operation and maintenance is 12.91% of the total amount because budgetary period of four (4) months is insufficient for the tendering procedures for the procurement. The budgetary period of the fiscal year 2002 will start from February 2002.

4.5. Monthly and Annual Revenue of Light Dues

4.5.1. Estimated Revenue of Light Dues for F iscal Year 2001 For the fiscal year of 2001, Directorate of Navigation, Directorate General of Sea Communication, Ministry of Communications has estimated total amount of light dues during 12 months, in Indonesian Rupiah 130,948,712,800.-(approximate 1,702 million Japanese Yen).

The estimated total amount of light dues to be collected for the fiscal year 2001 was obtained from the formula, Rp.200 per gross tonnage multiplied by average of total gross tonnage for the last two(2) years, i.e. fiscal year 1998 and 1999. The average gross tonnage was 654,743,564 GT.

4.5.2. Total Amount of Light Dues Collected from January 2001 to December 2001

As of January 2, 2002, the total amount of light dues collected from January 2001 to December 2001 is figured out in Indonesian Rupiah 112,808,434,999.07.-, which was deposited through the local banks, based on data source of Directorate of Navigation, Ministry of Communications. It is equivalent to approximate 1,466 million Japanese Yen or approximate 11.280 million US Dollars.

The total amount consists of Indonesian Rupiah 77,666,789,605.07 as local Currency and US\$3,464,388.99 equivalent to Indonesian Rupiah 35,141,645,394.- as foreign currency.

The total gross tonnages of vessels, which paid the light dues, are approximate 516,644,000GT, which consists of approximate 388,334,000GT of vessels paid in local currency and approximate 128,310,000GT of vessels paid in foreign currency.

This total amount, however, does not include the amount of light dues to be collected from Vessels of State-Owned Oil Company (PERTAMINA) and Indonesian National Shipping Company (PELNI).

They own visual aids to navigation independently established at and around some ports and where their vessels regularly visit. Those visual aids to navigation are operated and maintained by them.

As a result, the total amount of light dues figured during above twelve (12) months is about 86 % of the estimated revenue for the fiscal year 2001 mentioned in **Section 4.5.1**.

As of December, 2001, it is predicted that the total amount to be collected would come up to a target amount subject to the settlement of negotiation concerning "How to solve the problems" between Ministry of Communications and Ministry of Energy and Mineral Resources.

4.5.3. Non-taxation Revenue on Navigation Services Other than Light Dues Two non-taxation revenues on navigation services other than light dues, which are dues for rental services of shipyards and maritime telecommunication services, have been also collected from users.

The dues collected for twelve (12) months from January 2001 to December 2001 are figured as follows:

- Total amount of rental services of shipyard is Indonesian Rupiah 5,070,000.-
- Total amount of maritime telecommunication services is Indonesian Rupiah 2,179,310,088.-

Those non-taxation revenues are finally integrated with the light dues when three non-taxation revenues are allocated for operation and maintenance services.

4.5.4.Routine Budget and Supplementary Budget from Light Dues for Operation and Maintenance

The routine budget based on general account from fiscal year 1999/00 to fiscal year 2002 and the supplementary budget from light dues are shown in **Figure 4.2**.

In connection with the budgetary situation in the fiscal year 2001, the ratio of the routine budget was 57% (33,225 million Rupiah) to the requested budget (58,225 million Rupiah) from Directorate of Navigation.

The supplementary budget from the light dues in the fiscal year 2001 is 52,575 million rupiah.

The integrated budget consisting of routine budget and supplementary budget (85,800 Million Rupiah) which can utilize for operation and maintenance increased up to about 45.5% from the requested budget (58,225 million Rupiah) for the fiscal year 2001.

The ratio of acquisition of routine budget for operation and maintenance has been gradually recovering. If the routine budget increases, the supplementary budget from light dues could be allocated effectively for operation and maintenance.



Figure 4.2. Routine and Supplementary Budget by Year 2002

CHAPTER 5.

ESTABLISHMENT OF INVENTORY FOR FACILITIES

CHAPTER 5. ESTABLISHMENT OF INVENTORY FOR FACILITIES

5.1. Facilities of Aids to Navigation

5.1.1. Current Situation of Facilities

The current situation of the facilities concerning the aids to navigation services was confirmed through the site survey in the Study for the areas of the following District of Navigation Offices (DISNAV/Sub DISNAV) and their related aids to navigation facilities as shown in **Figure 5.1.1**.

The current situation of facilities on aids to navigation services was confirmed through the Site Survey carried out by the Study Team and the preparation of Inventory on aids to navigation services was executed by the local consultant.

The result of the survey on current situation is summarized for the visual and radio aids to navigation and their supporting facilities as follows;

(1) Current Situation of Visual Aids to Navigation

The following visual aids to navigation in Indonesia are operated and maintained by twenty-four (24) District of Navigation Offices (DISNAV/Sub DISNAV) under Directorate General of Sea Communication (DGSC) ;

Lighthouses	235 units
Light Beacon (incl. 7 units of RLB)	1,168 units
Light Buoy	332 units
Un-Light Beacon	260 units
Un-light Buoy	103 units

The allocation of lighthouses, light Beacons and light buoys is shown in **Figure 5.1.2.**, **Figure 5.1.3.** and **Figure 5.1.4.** respectively.

Figure 5.1.1. Area of Site Survey





Figure 5.1.2. Allocation of Lighthouse in Indonesia

Figure 5.1.3. Allocation of Light Beacon in Indonesia







(2) Current Situation of Radio Aids to Navigation

The following radio aids to navigation in Indonesia are maintained by twenty-two (22) District of Navigation Offices (DISNAV/Sub DISNAV) under Directorate General of Sea Communication (DGSC) ;

Medium Wave Radio Beacon Stations (MFB)	18 stations
Radar Beacon Stations (RACON)	84 stations
Differential Omega	5 stations

The allocation of Medium Wave Radio Beacon Stations, RACON and Differential Omega is shown in **Figure 5.1.5.**, **Figure 5.1.6**. and **Figure 5.1.7**., respectively.

(3) Current Situation of Supporting Facilities

The following supporting facilities for the aids to navigation services in Indonesia are operated and maintained by twenty-four (24) District of Navigation Offices (DISNAV/Sub DISNAV) under Directorate General of Sea Communication (DGSC) ;

Vessels for aids to navigation	services 75 units
a. Buoy tenders	(6 units)
b. Aids tender	(57 units including 4 supply vessels)
c. Inspection boat	(11 units)
d. Survey vessel	(1 units)
Buoy bases with Jetty	8 units
Workshop	25 units
Acetylene gas plant	1 units

(4) Current Situation of Management of Light

Management of facilities

The working areas of District of Navigation Offices (DISNAV/Sub DISNAV) were decided by the Decision of Director General of Sea Communication; UM/48/9/2-88 dated February 9, 1988. Each District of Navigation Office should follow this decision on operation and maintenance including management of their assets.

The assets such as lighthouse, light beacon and light buoy on development project have been followed this decision since 1989. However, there are some lighthouses and light beacons, which are not registered at competent DISNAV as the assets before year of 1988.

For example, there are two (2) visual aids to navigation. DISNAV Manado

/Bitung operates light aids of west side of Mayu Island. DISNAV Ambon operates light aids of east side of Mayu Island. Mayu Island has been actually under the responsibility of DISNAV Ambon since 1988.

Those aids to navigation should be urgently exchanged between or among the DISNAVs concerned in order to avoid wasteful operation and maintenance.

Light Number in List of Light (Daftar Suar Indonesia : DSI)

There are some ghost aids to navigation with light number in the List of Light, which had already collapsed and no more existing there. Those lights still are on the nautical chart, which were bought at the hydrographic office for **the Study**. The several lights of those, which locate at critical waters, should be promptly rehabilitated for the safety of mariners.

5.1.2. Establishment of Inventory

The local consultant carried out the survey for the preparation of inventory from May 1^{st} 2001 to June 30^{th} 2001. The arrangement of data and information collected during the site survey was completed at the end of July 2001.

The result of their services were submitted as the database to the Study Team. It is being utilized to grasp the current situation of the facilities on the aids to navigation services in Indonesia.

The inventory of facilities above will be transferred to DGSC when the Study has been completed. It will be useful for the operation and maintenance of facilities. This inventory should be continuously maintained by DGSC after the completion of the Study.







Figure 5.1.6. Allocation of RACON Stations in Indonesia





5.2. Facilities of Telecommunications System

5.2.1. Current Situation of the Facilities by Site Survey

It is necessary for the Study Team, upon implementing the Study, to grasp current situations on operation, maintenance, personnel training, facilities and equipment relating to coast stations (Class 1st, 2nd, 3rd and 4th-A, 4th-B) and the maritime SAR telecommunications systems which have been built by DGSC all over Indonesia.

The Study Team visited the coast stations as shown in **Table 5.2.1**. and the competent District NAVIGASI and ADPEL to make site survey.

Dis Nav	Station	Class
BELAWAN	Belawan	
DUMAI	Dumai	
TG. PINANG	Sei Kolak Kijang	
	Tg. Uban	
	Batu Amper (Batam)	
TELUK BAYUR	Teluk Bayur	
PALEMBANG	Palembang	
TG. PRIOK	Jakarta	
SEMARANG	Semarang	
CILACAP	Cilacap	
SURABAYA	Surabaya	
BENOA	Benoa	
KUPANG	Kupang	
BANJARMASIN	Banjarmasin	
SAMARINDA	Balikpapan	
	Samarinda	
MAKASSAR	Makassar	
MANADO/BITUNG	Bitung	
	Manado	-A

Table 5.2.1. Coast Stations Visited by the Study Team

The results of site survey are shown in **Appendix 5.2.1**. and the remarkable points on the systems and the facilities are as follows;

(1) The Study Team confirmed that 30 coast stations have been installed with GMDSS equipment. However, there still remain many blind zones to be covered by MF DSC and VHF DSC.

The expansion of GMDSS coverage should be studied.

(2) Although Teluk Bayur and Benoa stations are located at high priority

waters for maritime safety and has many links with other coast stations, both stations have been operated at a single site where the transmitters and the receivers are collocated.

The necessity for the separation of transmitting and receiving stations should be studied.

(3) In Surabaya and Makassar coast stations, noises caused by city activities are very big. These are unsuitable for the environment of receiving stations. Furthermore, the transmitting and receiving sites of Surabaya station and the receiving site of Makassar station are too limited in space to ensure the antenna system of 1st class station.

The above matters should be considered and improved.

(4) Dumai coast station can not communicate with the vessels passing the Strait of Malacca by VHF because of a big Rupat island existing in front of Dumai port.

Samarinda station is located about 30 km upriver from sea and so VHF area cannot be covered sufficiently.

These matters should be considered and improved.

- (5) DGSC headquarters moved to the present 25-story MOC building in 1997 and the Message Center has been remained in the old building. It should be re-established and modernized as an Information Center.
- (6) Some DGSC's regional offices are under discussion of autonomy policy in Indonesia.

Re-construction of district communication network for the reorganized DGSC's regional offices should be considered.

(7) Most engine-generators of the 1^{st} and 2^{nd} class coast stations are old, and there are no spare parts.

These should be improved.

(8) Most antennas of the 1^{st} and 2^{nd} class coast stations are old and should be improved.

5.2.2. Establishment of Inventory

The establishment work was carried out by a local consulting firm under an agreement with the Study Team.

The agreement was concluded on May 3, 2001 between the Study Team and the local consultant based on the Specifications for Drawing up The Inventory of The Maritime Telecommunication Facilities which was approved by JICA.

The investigation for the inventory was made on 221 coastal radio stations and 48 district offices such as DISNAV, KANWIL and ADPEL/KPLP, by means of questionnaire, actual field survey, interview with DGSC's personnel and in cooperation with the Study Team members and DGSC headquarters' personnel.

Through the investigation and the establishment work, general information of the stations (coordinates, address, geometrical location, land/building condition, power source, telephone line, etc.), institutional/human status (staff numbers and their capabilities, training records, etc.) and operation/maintenance matters (operating hours, communication traffic, equipment troubles, etc.) were cleared in addition to the inventory.

The local consultant has edited the results as,

Maritime Telecommunication Facilities; Inventory, Plant Records and Outlook - 2001 (Volume 1 - 4).

And this document (in 50 copies) was submitted to DGSC on November 15, 2001.

The planned and actual work schedule of the local consultant, and specimens of the inventory documents are shown in the **Appendix 5.2.2**. and **Appendix 5.2.3**. respectively.

CHAPTER 6.

CURRENT SITUATION OF GPS AND DGPS
CHAPTER 6. CURRENT SITUATION OF GPS AND DGPS

6.1. Measurement of Accuracy of GPS

The measurement of error of GPS was carried out in "First and Second Work in Indonesia" to measure and analyze the GPS positioning accuracy in Indonesia after the removal of Selective Availability for the following points;

- Measurement of static positioning error
- Confirmation of model differences based on the static error
- Confirmation of model differences based on the dynamic error
- Confirmation of seasonal change of static positioning error in dry and rainy season

The result of measurement and analysis are obtained based on the followings: (1) Static error

The static error was confirmed by the measurement at a fixed point with true coordinates in Jakarta for four (4) months.

(2) Dynamic error

The dynamic error was confirmed through the running measurement by a car and a ship. Kinematics GPS system that can provide a high accuracy positioning was utilized as standards GPS receiver for the GPS receivers for measurement.

(3) Error considering the difference among models of GPS receiver

The error considering the different model of GPS receivers was confirmed by five (5) GPS receivers. Those are popular model for marine navigation.

(4) Error considering seasonal changes

The error considering seasonal changes was confirmed through comparisons of the result of measurement works in dry and rainy season.

6.1.1. Static Error

(1) Period of the measurement

The first measurement	: May 06, 2001 to May 30, 2001 (25days)
The second measurement	: May 31, 2001 to June 30, 2001(31days)
The third measurement	: October 21 2001 to November 21 2001
	(31days).
The fourth measurement	: December 19 2001 to January 10 2002
	(32days).

(2) Circumstances required for the measurement

Maintain the room temperature and humidity specified for GPS receiver and laptop computers.

Guarantee of no obstruction and open space upper than fifteen (15) degrees

angle of elevation at the position of GPS antenna. Recovery of power failure within three (3) hours Maintaining of security of 24 hours.

(3) Place of the measurement

Place	: Jakarta Coastal Radio TX Station
Address	: Jl. Ancol Baru No.1 Jakarta Utara

(4) Standards position of antenna

Original reference position:

The original reference position to obtain standards position of each antenna was prepared in the Basic Design Study on the Project for Rehabilitation for Medium Wave Radio Beacon Stations in the Republic of Indonesia in 2000. The true coordinates are as follows;

S 06 ° 07' 08.19820" / E 106 ° 51' 47.66374"

Reference position of antenna of GPS receivers

The standards position of center of antenna for GPS receivers were offset respectively from the original reference point.

The true coordinates for each offset point for each antenna of GPS receiver are as follows;

a. No.1 GPS receiver: S 06 ° 07' 08.19972" / E 106 ° 51' 47.65000" b. No.2 GPS receiver: S 06 ° 07' 08.20710"/ E 106 ° 51' 47.67419" c. No.3 GPS receiver: S 06 ° 07' 08.18601" / E 106 ° 51' 47.65748" d.No.4 GPS receiver: S 06 ° 07' 08.18903" / E 106 ° 51' 47.67226" e. No.5 GPS receiver: S 06 ° 07' 08.21151" / E 106 ° 51' 47.66059"

 (5) Selection of GPS receivers for static accuracy measuring system of GPS Five (5) GPS receivers of different manufacturer's/models utilized to measure the static error.

GPS receivers being familiar to the mariners and different model each other.

Minimum standards applied to the GPS receivers, that is IMO resolution A.815 (19) and A.819 (19).

Data update interval of two (2) seconds minimum.

GPS receivers applied for a follow-up speed of 200knot.

(6) Measurement and analysis for GPS static error

Setting of equipment for the measurement of static accuracy of GPS a. Cables layout between GPS receivers and their antenna were selected minimum distance to avoid cable loss.

- b. Antenna of each GPS receiver was tightly fixed at the positions more than 0.45m apart from and around the antenna of original reference point on a flat plate to avoid interferences to/from each antenna.
- c. Equipment other than antenna was tightly and properly set on the steel desk in the measurement room.
- d. Temperature and humidity in measurement room for laptop computers as data recorder and GPS receiver were properly kept by an air-conditioner. Method of measurement
- a. Each GPS receiver was operated for twenty-four (24) hours continuously.
- b. Output data from the GPS receiver was automatically recorded by two (2) laptop computer as a dual duty system to avoid data loss.
- c. Data recorded for the analysis is a parts of NMEA-0183 Message based on the contents of each data specified by manufacturers.

Method of analysis

- a. The static accuracy can indicate based on "95% accumulative probability method" from GPS receiver".
- b. The first analysis is carried out for data obtained during twenty-four (24) hours. Those data are shown in **Appendix 6.1.1**.

(7) Result of analysis

Analysis of error

Four times of measurement works were carried out on May, June, October and December of year 2001 in Indonesia. The observed data was analyzed and calculated into the average error by cumulative probability method for each five (5) GPS Receivers as shown in **Table 6.1.1**. and **Appendix 6.1.2**. for five (5) GPS receivers respectively. Error of monthly analysis is shown in **Figure 6.1.1**.

	Measuremen	t duration		95%	
Lot number of GPS Receiver	Commenced date Finished date		Nos. of data	cumualtive probability (m)	
No.1 GPS Receiver	06-May-01	10-Jan-01	915,893	13.1	
No.2 GPS Receiver	06-May-01	10-Jan-01	915,388	8.9	
No3 GPS Receiver	06-May-01	10-Jan-01	1,001,855	11.6	
No4 GPS Receiver	06-May-01	10-Jan-01	5,063,665	8.7	
No.5 GPS Receiver	01-May-01	10-Jan-01	4,435,154	9.4	

Table 6.1.1. Static Error of Each GPS Receiver



Figure 6.1.1. Static Error of Each GPS Receiver by month

Result of Static error

The 95% cumulative error was calculated upon adoption of all data of five (5) GPS Receivers. The 10.5m static error is derived from its calculation result and adopted as Static error for the Study. This is shown in **Figure 6.1.2**.

10.5 m Probability (%) Static Error (m) -Cumulative probability for all data of all GPS Receivers _

Figure 6.1.2. Result of Static Error

6.1.2. Dynamic Error

(1) Period of the measurement

Measurement by car : July 2, 2001 to July 7, 2001 (6 days) Measurement by ship: July 9, 2001 to July 12, 2001 (4 days) Measurement by car : December 03, 2001 to December 04, 2001 (2 days) Measurement by ship: November 27, 2001 to November 27, 2001 (1 day)

(2) Circumstances required for the measurement

For the base station of Kinematic system, the circumstances for the measurement of static accuracy mentioned in **Section 6.1.1.(2)** are required, in order to keep the accuracy for the standards system of measurement.

For rover side (car and ship), it is required that the antennas of GPS GPS receiver should be raised up as far as possible to avoid the blackout of signals.

(3) Place of the measurement

Moving by car Sailing by ship

: Between Karangampel and Cirebon : Off Jakarta

(4) Reference position of antennas

Original reference position of the Kinematic system

The original reference position of moving object is obtained by Kinematic survey with high accuracy.

The control point required for the Kinematic survey was changed, because trees sheltered an antenna of GPS receiver for Kinematic survey.

The true coordinates of control point are station No. 10395 (S 06 ° 35' 30.771188" / E 108 ° 30' 43.25045") managed by BAKOSURTANAL for the measurement by car.

The reference point for the measurement of static accuracy was used for the measurement by ship.

Standard position for antenna of five moving GPS receivers Each standard position (true coordinates) for antenna of moving GPS receiver is obtained by calculation on a rectangular coordinates based on the standard point of antenna of Rover antenna for Kinematic survey.

Standards speed and heading of moving object

The standards speed and heading of moving object is a speed obtained from Kinematic system.

(5) Selection of GPS receivers and Kinematic GPS receiver

GPS receiver

The specifications for five (5) GPS receivers are same as mentioned in **Section 6.1.1.(4)**.

Kinematic GPS receiver

Kinematic GPS receiver shall be a model approved by Geographical Survey Institute in Japan for Kinematic survey. It shall be complied with 200knot or over of follow-up speed.

Model of Kinematic GPS system : TRIMBLE 5700

(6) Measurement and analysis for GPS dynamic error

Setting of equipment for the measurement

a. Base antenna for the Kinematic antenna was tightly set on the center of the control point known true coordinates.

b. GPS antenna of each GPS receiver and Rover antenna of Kinematic system was tightly equipped on the roof of car. The top plane of antenna was 2.5 m above ground level.

Method of measurement

a. Measurement by car

- i. The moving speed of object was 10km to 90km per hour every 10km.
- ii. The moving speeds of object were generally kept at 20km up to 70km. However, the speeds of 10km, 80km and 90km had fluctuated about 10 percent.
- iii. Each GPS receiver and Kinematic System were switched on before three hours prior to the starting of measurement.
- iv. The analysis of Kinematic survey was carried out by post processing. The Real Time Kinematic survey (RTK) was applied for data checking.

b. Measurement by ship

- i. Measurement at sea was carried out by ship with crusing speed of 20knot.
- ii. The speed of moving object was 5knot, 10knot, 15knot and 20 knot for the measurement.
- iii. The speeds for the measurement were generally kept at the target speeds.
- iv. Each GPS receiver and Kinematic system were switched on before three hours to the starting of measurement.

Method of analysis

Measured data for five (5) GPS Receivers was analyzed as follows:

a. Calculation of absolute distance (x) from Standard co-ordinate.

b. Creation of Histogram by distance (x) and frequency.

c.Calculation of distance (L) by 95% probability

Result of analysis

- a. The analyzed data of each GPS receiver for each speed by car and ship are shown in **Table 6.1.2**. and **Table 6.1.3**.
- b. Error of each GPS Receiver per speed by car and ship are shown in **Figure 6.1.3** and **Figure 6.1.4**.

Table 6.1.2. Measurement of GPS Accuracy per Speedon July 5 th and 11 th 2001 (Dynamic Accuracy)

		95% cumulative error (m)				
Speed	No. of GPS receiver	June	December	Mean		
10km	No 1 GPS Receiver	8.6	7.9	8.3		
20km	No 1 GPS Receiver	7.9	14.1	11.0		
30km	No 1 GPS Receiver	17.2	9.2	13.2		
40km	No 1 GPS Receiver	18.8	15.3	17.1		
50km	No 1 GPS Receiver	11.5	18.6	15.1		
60km	No 1 GPS Receiver	15.8	18.7	17.3		
70km	No 1 GPS Receiver	15.8	16.6	16.2		
80km	No 1 GPS Receiver	19.1	18.6	18.9		
90km	No 1 GPS Receiver	19.1	19.1	19.1		
10km	No 2 GPS Receiver	4.2	10.1	7.2		
20km	No 2 GPS Receiver	3.6	6.4	5.0		
30km	No 2 GPS Receiver	5.0	4.7	4.9		
40km	No 2 GPS Receiver	7.1	4.5	5.8		
50km	No 2 GPS Receiver	3.6	5.0	4.3		
60km	No 2 GPS Receiver	5.0	4.8	4.9		
70km	No 2 GPS Receiver	9.6	9.1	9.4		
80km	No 2 GPS Receiver	4.0	3.4	3.7		
90km	No 2 GPS Receiver	4.0	7.3	5.7		
10km	No 3 GPS Receiver	3.3	6.7	5.0		
20km	No 3 GPS Receiver	5.2	5.7	5.5		
30km	No 3 GPS Receiver	3.0	5.6	4.3		
40km	No 3 GPS Receiver	9.2	9.1	9.2		
50Km	No 3 GPS Receiver	0.7	11.4	9.1		
70km	No 2 CDS Deceiver	0.2	10.3	13.3		
70KIII 80km	No 2 CDS Deceiver	12.9	10.0	14.7		
90km	No 3 GPS Receiver	11.2	10.0	15.3		
10km	No 4 GPS Receiver	0.5	10.0	0.8		
20km	No 4 GPS Receiver	0.0	0.9	0.0		
30km	No 4 GPS Receiver	1.0	1.3	12		
40km	No 4 GPS Receiver	2.9	0.9	1.9		
50km	No 4 GPS Receiver	0.8	0.9	0.9		
60km	No 4 GPS Receiver	4.1	1.4	2.8		
70km	No 4 GPS Receiver	4.4	1.9	3.2		
80km	No 4 GPS Receiver	4.9	0.5	2.7		
90km	No 4 GPS Receiver	3.9	1.4	2.7		
10km	No 5 GPS Receiver	3.9	7.9	5.9		
20km	No 5 GPS Receiver	4.4	7.5	6.0		
30km	No 5 GPS Receiver	6.4	8.9	7.7		
40km	No 5 GPS Receiver	12.9	14.7	13.8		
50km	No 5 GPS Receiver	10.7	16.9	13.8		
60km	No 5 GPS Receiver	14.5	19.4	17.0		
70km	No 5 GPS Receiver	18.9	18.9	18.9		
80km	No 5 GPS Receiver	17.7	17.9	17.8		
90km	No 5 GPS Receiver	18.6	19.5	19.1		

Table 6.1.3. Measurement of GPS Accuracy per Speedon Dec. 4th 2001 (Dynamic Accuracy)

		95% cumulative error (m)				
Speed	No. of GPS receiver	June	December	Mean		
05knot	No 1 GPS Receiver	5.9	3.9	4.9		
10knot	No 1 GPS Receiver	8.0	18.7	13.4		
15knot	No 1 GPS Receiver	8.6	17.9	13.3		
20knot	No 1 GPS Receiver	6.4	11.9	9.2		
05knot	No 2 GPS Receiver	2.2	3.1	2.7		
10knot	No 2 GPS Receiver	5.9	7.6	6.8		
15knot	No 2 GPS Receiver	2.4	7.0	4.7		
20knot	No 2 GPS Receiver	2.4	6.4	4.4		
05knot	No 3 GPS Receiver	2.5	2.6	2.6		
10knot	No 3 GPS Receiver	2.4	8.0	5.2		
15knot	No 3 GPS Receiver	2.9	9.9	6.4		
20knot	No 3 GPS Receiver	3.5	12.5	8.0		
05knot	No 4 GPS Receiver	0.5	0.9	0.7		
10knot	No 4 GPS Receiver	0.9	1.4	1.2		
15knot	No 4 GPS Receiver	0.9	1.4	1.2		
20knot	No 4 GPS Receiver	0.5	1.5	1.0		
05knot	No 5 GPS Receiver	2.9	3.6	3.3		
10knot	No 5 GPS Receiver	5.3	5.4	5.4		
15knot	No 5 GPS Receiver	5.9	16.7	11.3		
20knot	No 5 GPS Receiver	7.5	19.2	13.4		

Figure 6.1.3. Error of Each GPS Receiver per Speed (Dynamic Accuracy by car)





Figure 6.1.4. Error of Each GPS Receiver per Speed (Dynamic Accuracy by ship)

GPS Receivers for navigation use of vessel are selected for measurement work as sample. As a result, dynamic error does not exceed beyond 15m until speed of 20knots. In case the vessel speed exceeds 20knots, dynamic error of some of sample increases in accordance with cruising speed and the dynamic error of remain does not increase in accordance with cruising speed. It may be caused by firmware of GPS receiver prepared by manufacturer. **6.1.3. Differences of Error among different Models of GPS Receiver** The error of each model of GPS receivers is indicated as the distances between the mean coordinates indicated by the GPS receivers. The differences of error among different models of GPS receiver are analyzed for the static and dynamic accuracy as follows;

(1) Differences on static accuracy

The differences of error among different models of GPS receivers on static accuracy are summarized as shown in **Table 6.1.4.** and **Figure 6.1.5.**, based on the result through analysis of both the static and dynamic accuracy.

Standards :		<u>Standards</u>		Standards:	
No.1 GPS Receiver		No.2 GPS Receiver		No.3 GPS Receiver	
No.2 GPS Receiver	2.09	No.1 GPS Receiver	2.09	No.1 GPS Receiver	2.23
No.3 GPS Receiver	2.23	No.3 GPS Receiver	4.74	No.2 GPS Receiver	4.74
No.4 GPS Receiver	1.26	No.4 GPS Receiver	3.22	No.4 GPS Receiver	1.53
No.5 GPS Receiver	1.18	No.5 GPS Receiver	2.89	No.5 GPS Receiver	1.91
Standards :		Standards :			
No.4 GPS Receiver		No.5 GPS Receiver			
No.1 GPS receiver	1.26	No.1 GPS receiver	1.18		
No.2 GPS Receiver	3.22	No.2 GPS Receiver	2,89		
No.3 GPS Receiver	1.53	No.3 GPS Receiver	1.91		
No.5 GPS Receiver	0.51	No.4 GPS Receiver	0.51		

Table 6.1.4. Differences of Static Error among Five GPS Receiver

: shows maximum & Minimum

Figure 6.1.5. Fluctuations of Differences of Static Error among Five GPS Receivers



Unstable duration of accumulated data

The fluctuations of differences of error among different models show to be decreased after around 10 days from the commencing of measurements as

shown in **Figure 6.1.5**.

It is stabilized until around three weeks after the commencing of measurement.

After ten (10) more days the differences of distance between the mean coordinates among every center of error distribution nearly stop to fluctuate.

Result of analysis

Therefore, the results of analysis for the differences of error among five (5) GPS receivers in static accuracy can be analyzed at the date of May 31, 2001. The results are shown in **Table 6.1.5**.

- The maximum difference of error is 4.74m between No.2 and No.3 GPS receiver. The minimum differences of error is 0.51m between No.4 and No.5 GPS Receiver.
- The differences of error among different models of GPS receiver are ranging from 4.74m to 0.51m.

Maximum difference among five (5) receivers is 4.74m by 95% cumulative probability. It means that there is no obstacle for usual navigation of vessels. But it is required to recognize distance between ships in case the repeatability of setting of co-ordinates is required for the purpose of fishery.

	No.1-No.2	No.1-No.3	No.1-No.4	No.1-No.5	No.2-No.3	No.2 No.4	No.2-No.5	No.3-No.4	No.3-No.5	No.4 No.5
Date	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
Jay 01 2001								2.72	3.55	0.63
Ley 02 2001	3.39	3.83	2.16	1.88	7.68	5.40	5.21	2.31	2.47	0.46
May 03 2001	3.25	1.50	1.12	0.94	6.14	4.35	4.11	1.79	2.17	0.72
May 04 2001	2.69	1.68	1.17	1.16	5.51	3.85	3.63	1.66	2.03	0.67
May 05 2001	2.58	1.89	1.54	1.45	5.39	4.02	3.89	1.87	1.84	0.72
May 06 2001	2.49	1.91	1.32	1.30	5.37	3.79	3.54	1.61	1.91	0.76
May 07 2001	2.47	1.95	1.30	1.23	6.33	3.76	3.48	1.64	1.89	0.78
Lav 08 2001	2.43	1.96	1.31	1.22	5.80	8.78	3.42	1.64	1.92	0.77
May 09 2001	2.40	1.97	1.23	1.15	5.28	3.61	3.29	1.72	2.04	0.72
May 10 2001	2.40	2.00	1.33	1.21	5.24	371	3.37	1.68	1.90	0.70
May 11 2001	2.39	2.08	1.37	1.25	5.20	3.78	3.40	1.52	1.84	0.67
May 12 2001	2.38	2.02	1.18	1.19	5.20	3.50	3.23	1.71	2.03	0.64
19 2001 Fay 18 2001	2.36	2.01	117	1 20	518	8.45	319	178	2.07	0.60
View 14 2001	2.35	2.02	119	1 20	515	3.45	318	1.71	2.05	0.59
Vev 15 2001	2.33	2.04	1.24	1.23	514	3.46	319	1.68	2.03	0.57
Jay 16 2001	2.98	2.07	1.01	1.26	511	3.50	3.22	1.62	1 97	0.57
Jay 17 2001	9.92	210	1.34	1.51	510	3.55	3.28	1.55	1.09	0.58
June 18 2001	2.30	210	1.34	1.22	5.09	3.54	3.23	1.65	1.03	0.57
(sv 19 2001	2.00	219	1.04	1.50	5.07	3.58	3.22	1.50	1.91	0.58
Log 20 2001	9.90	2.15	1.02	1.50	5.05	3.59	3.20	1.52	1.01	0.50
Mary 20 2001	9.98	219	1.99	1.04	5.04	3.55	3.20	1.00	1.89	0.55
Log 29 9001	0.40	213	1.30	1.59	5.09	9.50	310	1.95	1.00	0.00
Low 93 9001	4.40 9.90	914	1.00	1.25	1.00	2.42	3.10	1.01	1.00	0.00
Ears 94 9001	0.10	010	1.00	1.20	4.80	0.40	9.00	1.04	1.01	0.55
189 24 2001	2.12	2.18	1.01	1.21	4.01	0.00	2.59	1.34	1.50	0.58
day 20 2001	5.00	0.01	1.01	1.13	4.04	201	9.00	1.08	1.07	0.00
189 20 2001	9.00	0.6L 9.02	1.40	1.60	4.01	2.69	9.05	1.07	1.09	0.00
139 21 2001	2.00	0.09	1.01	1.22	4.00	0.47	4.50 0.08	1.32	1.90	0.54
aay 28 2001	2.08	0.04	1.01	1.20	478	0.28	0.00	1.60	1.80	0.04
NIRY 23 2001	2.09	2.29	1.36	1.32	475	52.6	2.90	1.97	1.00	0.55
May 30 2001	2.08	2.22	1.21	1.19	4.75	0.22	2.91	1.55	1.91	0.52
day 31 2001	2.09	2.23	1.26	1.18	474	8.22	2.89	1.53	1.91	0.51
June 1 2001	2.09	2.24	1.2(1.17	474	5.28	2.90	1.51	1.90	0.51
June 2 2001	2.09	2.24	1.26	1.17	4.74	3.22	2.90	1.52	1.89	0.50
June 3 2001	2.09	2.23	1.26	1.16	471	3.20	2.88	1.50	1.89	0.49
June 4 2001	2.09	2.22	1.25	1.13	4.70	8.17	2.84	1.55	1.91	0.48
June 5 2001	2.08	2.21	1.22	1.13	4.69	314	2.82	1.55	1.94	0.47
June 6 2001	2.08	2.24	1.23	1.13	4.69	3.14	2.82	1.64	1.93	0.47
June 7 2001	2.09	2.25	1.22	1.12	4.68	5.14	2.81	1.54	1.98	0.47
June 8 2001	2.08	2.24	1.20	1.11	467	3.11	2.79	1.56	1.94	0.47
June 9 2001	2.08	2:28	1.20	1.11	4.67	8.10	2.78	1.67	1.96	0.47
une 10 2001	2.08	2.23	1.18	1.09	4.66	3.08	2.75	1.58	1.97	0.47
une 11 2001	2.08	2.21	1.17	1.08	4.65	3.06	2.73	1.60	1,99	0.46
une 12 2001	2.08	2.21	1.18	1.08	4.65	8.05	2.74	1.61	1.98	0.45
une 13 2001	2.07	2.22	1.17	1.08	4.65	3.05	2.72	1.60	1.99	0.48
une 142001	2.07	2.24	1.17	1.08	4.65	3.06	2.72	1.59	1.99	0.46
une 15 2001	2.07	2.24	1.16	1.07	4.64	3.04	2.71	1.60	2.00	0.48
une 16 2001	2.06	2.25	1.17	1.07	4.65	3.05	2.71	1.60	2.00	0.47
une 17 2001	2.07	2.26	1.18	1.06	4.64	3.06	2.70	1.68	2.00	0.48
une 18 2001	2.06	2.26	1.17	1.04	4.64	3.06	2.70	1.59	2.00	0.47
une 19 2001	2.06	2.27	1.18	1.04	4.64	3.05	2.69	1.69	2.01	0.47
une 20 2001	2.06	2.27	1.18	1.04	4.65	8.05	2.69	1.60	2.00	0.48
une 21 2001	2.07	2.28	1.17	1.05	4.65	3.05	2.69	1.60	2.01	0.46
une 22 2001	2.07	2,30	1.16	1.05	4.65	3.03	2,69	1.61	2.01	0.45
une 28 2001	2.08	2.81	1.15	1.03	4.64	8.04	2.88	1.61	2.04	0.49
une 24 2001	2.08	2.33	1.15	1.02	4.64	3.04	2.66	1.60	2.04	0.49
une 25 2001	2.09	2.33	1.15	1.02	4.64	3.04	2.66	1.61	2.04	0.49
une 26 2001	2.09	2.33	1.14	1.00	4.64	3.04	2.65	1.61	2.05	0.49
une 27 2001	2.09	2.34	1.14	1.00	4.64	3.03	2.64	1.61	2.05	0.49
une 28 2001	2 10	2.95	118	0.99	4.64	8.04	2.85	1.61	2.05	0.49
une 29 2001	210	2.95	112	0.98	4.64	3.03	2.64	1.62	2.05	0.48
uno 30 9001	210	2.00	110	0.07	4.65	3.02	9.64	1.60	2.05	0.49
TWO DO BINT	0.10	0.00	1.1.1.12	0.01	3.00	0.00	0.01	1.00	0.00	1 9.20

Table 6.1.5. Differences of Static Error among Five GPS Receivers per Day

(2) Differences of error among different models of GPS receivers on dynamic accuracy

The differences of error among different models of GPS receivers on dynamic accuracy are summarized in **Figure 6.1.6.** and **Table 6.1.6.**, based on the data obtained through analysis of dynamic accuracy.

The differences of error among different models of GPS receivers can be indicated by a maximum and a minimum of errors among different models.

At general cruising speed

- a. The maximum of the error is 28.53m at 20knot between No.1 and No.5 GPS receivers.
- b.The minimum of the error is 0.32m at 30km at sea between No.3 and No4. GPS receivers
- c. The differences of error among different models of GPS receivers are ranging from 28.53m to 0.32m at general cruising speed of ship. Over the general cruising speed
- a. The maximum of the error is 77.44m at 70km on land between No.1 and No.5 GPS receivers.
- b. The minimum of the error is 3.55m at 50km on land between No.2 and No.4 GPS receivers.
- c. The differences of error among different models of GPS receivers are ranging from 77.4 m to 3.55m.
- d. The difference of the error is largely increasing when the speed was over the general cruising speed.

Dynamic difference among GPS receivers is shown in **Figure 6.1.6** and Table 6.1.6. Maximum difference among GPS receivers is 28.53m that is taken by 20knots maximum speed of usual vessels. In case the cruising speed is exceeded beyond 20knots, 50m differences is observed in some combination of receivers. This may be caused by characteristics of receivers that have unique processing installed by manufacturer. This means that these characteristics to measure position should be recognized.

Figure 6.1.6. Differences of Dynamic Error among Different Model of GPS Receivers



G = 1 = 1 = D =	0.0300.000			, <i>1</i>				<u>, , , , , , , , , , , , , , , , , , , </u>					
Standards Re	ceiver										2		
No.1 GP5 Rec	ceiver		1.01		1.51		0.01						
GPS Receiver	(9km)	10km	(19km)	20km	(28km)	30km	(37km)	40km	50km	60km	70km	80km	90km
No.2	10.28	13.81	10.44	7.32	16.79	4.52	14.08	6.66	15.85	21.21	37.78	27.32	24.08
No.3	7.39	2.88	2.67	8.75	14.94	8.99	12.57	6.38	7.33	19.51	24.31	19.42	16.38
No.4	8.97	12.76	7.63	6.85	20.22	8.74	16.00	7.94	18.78	29.79	40.83	33.52	29.83
No.5	10.16	21.10	21.39	11.07	24.68	17.41	28.53	19.58	40.98	56.59	77.44	62.81	60.39
a													
No 2GPS Reco	ceiver	17						-				-	
10.201 0 1600	Eknot	10000000	10knot		15knot	200.300+1	20knot	100000-00-0	VI-HOME	AND 81047	and service and		ago a parte r
GPS Receiver	(9km)	10km	(19km)	20km	(28km)	30km	(37km)	40km	50km	60km	70km	80km	90km
No.1	10.28	13.81	10.44	7.32	16.79	4.52	14.08	6.66	15.85	21.21	37.78	27.32	24.08
No.3	3.56	11.72	7.77	8.04	3.87	4.57	15.20	0.47	12.22	5.77	14.36	13.44	8.09
No.4	4.70	3.55	3.13	5.65	7.36	4.36	4.56	3.41	3.55	8.58	9.37	7.68	9.12
No.5	7.77	7.99	11.21	11.28	16.53	13.11	14.54	17.51	25.94	35.94	42.62	35.55	41.61
Standards Ro	coiver	-								1			
No3GPS Rece	iver												
GPS Receiver	5knot	10km	10knot	20km	15knot	30km	20knot	40km	50km	60km	70km	80km	90km
No 1	7 30	2.99	2.67	875	14 94	9.00	12.57	6 3 9	7.33	19.51	94.31	19.49	16.39
No.2	3.56	11 72	7.77	8.04	3.97	4.57	15.20	0.00	19.99	577	14.96	13.44	8.00
No.4	9.47	10.91	1.11	2.53	5.92	0.32	13.20	3.11	1413	12.00	16.64	16.36	13.90
No.4	5.39	19.61	1979	9.99	19.02	9.65	97.79	1710	39.14	40.01	F9.41	47.03	45.97
10.0	0.00	10.01	10.10	0.20	10.80	0.00	21.10	11.10	00.14	40.01	00.41	£1.00	40.01
Standards Re	ceiver												
No.4GPS Rec	eiver	1				1				1			
GPS Receiver	5knot (9km)	10km	10knot (19km)	20km	15knot (28km)	30km	20knot (37km)	40km	50km	60km	70km	80km	90 km
No.1	8.97	12.76	7.63	6.85	20.22	8.74	16.00	7.94	18.78	29.79	40.83	33.52	29.83
No.2	4.70	3.55	3.13	5.65	7.36	4.36	4.56	3.41	3.55	8.58	9.37	7.68	9.12
No.3	2.47	10.21	4.98	2.53	5.82	0.32	13.20	3.11	14.13	12.00	16.64	16.36	13.80
No.5	3.14	8.40	14.33	5.71	9.43	8.75	14.63	14.11	24.43	28.01	36.78	30.67	32.69
a													
Standards Re	ceiver	1	-			-							
No.5GP5 Rec	eiver		1.01		1.51	0	001			2			
GPS Receiver	(9km)	10km	(19km)	20km	(28km)	30km	(37km)	40km	50km	60km	70km	80km	90km
No.1	10.16	21.10	21.39	11.07	24.68	17.41	28.53	19.58	40.98	56.59	77.44	62.81	60.39
No.2	7.77	7.99	11.21	11.28	16.53	13.11	14.54	17.51	25.94	35.94	42.62	35.55	41.61
No.3	5.38	18.61	18.78	3.23	13.80	8.55	27.78	17.19	38.14	40.01	53.41	47.03	45.87
No.4	3.14	8.40	14.33	5.71	9.43	8.75	14.63	14.11	24.43	28.01	36.78	30.67	32.69
	5knot (9km)	10km	10knot (19km)	20km	15knot (28km)	30km	20knot (37km)	40km	50km	60km	70km	80km	90km
Max	10.28	21.10	21.39	11.28	24.68	17.41	28.53	14.11	40.98	56.59	77.44	62.81	60.39
Min	2.47	2.88	2.67	2.53	3.87	0.32	4.56	0.47	3.55	5.77	9.37	7.68	8.09
Legend:		Minimu	ım										
		Maxim	ım										

Table 6.1.6. Differences of Error among Five GPS Receivers(Dynamic Accuracy)

6.1.4. Seasonal Changes of Errors

(1) General

Dry season was applied to a measurement of GPS in the First Work in Indonesia. Rainy season was applied to a measurement of GPS in the Second Work in Indonesia.

The analysis of seasonal changes of errors was carried out on the result of analysis for the static errors in two (2) seasons.

(2) Measured data in dry season

Measurement work was carried out from May 06 2001 until June 30 2001 in Jakarta. Measured data and statistical calculation result is shown as **Table 6.1.7**.

Sample number of GPS	Measure	d date	Number of	Error (m)			
Receiver	Start	End	Sample				
No.1 GPS Receiver	06-May-01	30-May-01	207,547	13.5			
	31-May-01	30-Jun-01	258,394	13.2			
No.2 GPS Receiver	06-May-01	30-May-01	207,333	8.9			
	31-May-01	30-Jun-01	256,921	7.9			
No3 GPS Receiver	06-May-01	30-May-01	207,721	12.7			
	31-May-01	30-Jun-01	256,516	11.7			
No4 GPS Receiver	06-May-01	30-May-01	2,032,760	9.0			
	31-May-01	30-Jun-01	2,554,635	8.5			
No.5 GPS Receiver	01-May-01	30-May-01	1,033,771	9.7			
	31-May-01	30-Jun-01	1,152,441	9.5			
Statistical calculation result:							
Mean (m) = 10.5							
Standard Deviation (SD) = 2.1							
Variance (V) =				4.4			

Table 6.1.7. Measured Data for Dry Season

(3) Measured data in Rainy season

Measurement work was carried out from May 06 2001 until June 30 2001 in Jakarta. Measured data and Statistical calculation result is shown as **Table 6.1.8**.

Sample number of GPS	Measure	ed date	Number of	Ermon (m)				
Receiver	Start	End	Sample	Error (III)				
No.1 GPS Receiver	21-Oct-01	21-Nov-01	264,917	14.3				
	19-Dec-01	10-Jan-01	189.920	7.4				
No.2 GPS Receiver	21-Oct-01	21-Nov-01	265,485	11.2				
	19-Dec-01	10-Jan-01	191.205	7.6				
No3 GPS Receiver	21-Oct-01	21-Nov-01	351,959	11.7				
	19-Dec-01	10-Jan-01	101,217	7.5				
No4 GPS Receiver	21-Oct-01	21-Nov-01	2,644,160	9.2				
	19-Dec-01	10-Jan-01	1,849,969	4.2				
No.5 GPS Receiver	21-Oct-01	21-Nov-01	1,322,696	10.4				
	19-Dec-01	10-Jan-01	947.737	7.5				
Statistical calculation result:	Statistical calculation result:							
Mean (m) =				9.1				
Standard Deviation (SD) =				2.9				
Variance (V) =				8.2				

Table 6.1.8. Measured Data for Rainy Season

(4) Analysis of seasonal error

Setting up of hypothesis.

Test is done to clarify whether there is difference between GPS error (1) and GPS error (2) or not.

GPS error (1) is GPS error (μ_0) that was measured in Dry season. GPS error (2) is GPS error (μ) that was measured in Rainy season.

Now, it is set up that there is difference between GPS error (1) and GPS error (2) as follows:

Calculation of mean (x) and valiance (V) Mean and valiance are calculated based on data that is shown **Table 6.1.9**. Calculation result is as follows:

x = 9.1	(Mean of GPS error)
V = 8.2	(Valiance of GPS error)

 $Calculation \ of \ t_0.$

'n' = number of sample as shown in **Table 6.1.9.**, then n = 10. Calculation result is as follows:

 $t_0 = (x - \mu_0)/ (V/n) = (9.1 - 10.5)/ (8.2/10) = 1.546$ Judgment of significance If the following formula is true,

 $R: |t_0|$ t (, á) á = 0.05, = Nos. of sample – 1 = 10 - 1

the hypothesis is rejected. Hypothesis is as follows:

"There is difference between GPS error (1) and GPS error (2)."

t (, á) is calculated as follows: t (, á) = t (, á) = t (9, 0.05) = 2.226 = n - 1, = 0.05 t₀ and t (, á) are compared, then

 $t_0 = 1.\ 546 \qquad \qquad t\ (\quad ,\ \acute{a}) = t\ (9,\ 0.05) = 2.226$

then, hypothesis of "There is difference between GPS error (1) and GPS error (2)" is rejected.

Conclusion

Calculation result shows by 5% significance level that there is no difference between GPS error (1) and GPS error (2).

6.2. Survey of GPS (including DGPS) Needs

6.2.1. Methodology of the Survey

(1) Questionnaire

This study was executed by the form of Questionnaire. It was composed of 20 questions in English drafted by the Study Team and printed in English and Indonesian in parallel as shown in **Appendix 6.2.1**. These were distributed to the seafarers as shown in **Appendix 6.2.2**.

The contents of questionnaire are summarized as follows:

Major specifications and situation of the ships mode of navigation,etc. Users' needs for position fixing device Users' needs for GPS and DGPS Intention for utilizing DGPS User profile a. Name b. Address c. Telephone d. FAX e. E-mail

(2) Method of survey

This survey was executed by means of using a questionnaire form by the Local Consultant contracted with the Study Team as follows:

Target of the survey

The questionnaires were distributed to seafarers through ship's owners. The target was to confirm current situation of utilizing GPS as equipment for position fixing and necessity of introducing of DGPS system in Indonesia.

Process of the survey

- a. The local consultant translated the questionnaire prepared by the Study Team in English into Indonesian.
- b. At first, the local consultant prepared 5,000 copies of questionnaires, but added to 1,000 copies later. So, total of 6,000 copies was prepared.
- c. The survey by questionnaire applied to ships of Indonesian flags.
- d.In order to promote collection of questionnaire efficiently, the local consultant visited to main local offices of Directorate General of Sea Communication (DGSC) such as Port Administrator offices (ADPELs) and Port Offices (KANPELs) of 19 District of Navigation offices (DISNAVs). Then they explained the purpose of survey and content of questionnaire and asked their cooperation.
- e. For the ADPELs and KANPELs near the DISNAVs of Sabang, Ambon,

Sorong, Jayapura and Merauke, the local consultant sent the questionnaire by a parcel and explained the purposes of making survey and contents of the questionnaire through telephone, FAX and other communication means. Then they obtained cooperation from those offices.

- f. The local consultant pushed reply to the questionnaires through telephone and other communication system.
- g. Closing date of reply to questionnaire was 31 August 2001.
- h.Replies to questionnaires received by the local consultant before closing date, were arranged as database by the local consultant, and analyzed by the Study Team.

6.2.2. Implementation of the Survey

The local consultant executed the site survey for GPS needs including DGPS from May 1^{st} 2001 to June 30^{th} 2001 under the supervision of the Study Team.

The questionnaires were sent to a total of 273 offices given in **Appendix 6.2.2.** Those locations were selected based on locations given in DGSC logbook data on the light dues which ships of over 35 gross tonnage are applicable. However, the ship of less than 35 gross tonnage(GT) are included in this questionnaire survey.

The local consultant's surveyors visited to each places, and contacted with local officers concerned with DGSC at 5 locations to obtain their cooperation. And the members of The Study Team had supported their survey for explanation of intention on this questionnaire survey to the local offices concerned with DGSC when they visited.

Locations visited by the local consultant

Local consultant visited the following locations:

	-		
Belawan	Sibolga	Dumai	Tg. Pinang
Tlk, Bayur	Palembang	Tg. Priok	Semarang
Cilacap	Surabaya	Benoa	Pontianak
Banjarmasin	Samainda	Tarakan	
Manado/Bitung	Kendari	Makassar	Kupang

6.2.3. Result of the Survey

(1) General

The advantage of GPS is that the accurate position of a ship during sailing can be decided without affected by weather or time, so if additional equipment such as transmitter is combined with the GPS, the ship could report the accurate position any time.

For example, a ship can fix its position even in a dense fog. If more sophisticated system such as radar equipment is available, the ship could safely avoid collision with other ship during bad weather. To keep high safety during sailing, international community, in this case IMO (International Maritime Organization), has agreed that to improve navigation capability, Automatic Identification System (AIS) should be applied to ships.

To observe the user requirement of GPS system, the Study Team tried to collect information from the respondents (community) representing the users. The Study team has prepared the questionnaire form that consists of 20 questions.

The distributed number of questionnaire was 5,780, and collected was 1,215, so the rate of collection was 21%.

Type of Ship

The type of responded ships and their percentage are shown in **Figure 6.2.1**.



Figure 6.2.1. Type of Ship N=1215



Figure 6.2.2. Answered Ships by GT N=1215

(2) A trend of user needs to position fixing means of ship

In order to grasp a trend of user needs for a position fixing devices, we studied on boarding situation of four devices which were Radio Direction Finder, Radar, GPS Receiver and Loran C Receiver.

Both 340 of international voyage ship and 875 of domestic voyage ships were fitted with GPS receiver most. That is 42.6% of international and 49.3% of domestic voyage ship. The result is shown in **Figure 6.2.3**.

Figure 6.2.3. Electronic Apparatus for Navigation on Board in International and Domestic Voyage Ships



In general, it is considered that GPS receivers are the most reliable tools for navigation recently. Then we started to analyze these figures by Type and GT of Ship.

GPS receiver on board by Type of Ship

The result is shown **in Figure 6.2.4**. And GPS receivers were installed in all 4 ships of ore carrier, all 56 ships of container carriers, and all 7ships for official craft ship.





GPS receiver on board by Gross Tonnage The result is shown **in Figure 6.2.5**.

Figure 6.2.5. GPS Receiver on Board by Gross Tonnage



(3) A trend of user needs for GPS and DGPS

We studied what kinds of GPS receivers are used to know the trend of the user needs for GPS and DGPS quantitatively.

Type of GPS Receiver

GPS receiver has a various accessories depend on the required function. Then it will be divided into 3(three) categories.

a. GPS receiver without any accessory

b. GPS receiver with some accessory

c. GPS receiver being able to receive DGPS signal

Figure6.2.6. shows the GPS receivers by respondent according to the categories above.





Experience of Using DGPS

Only 323 ships of respondents who equipped with GPS receivers answered that they have experienced using DGPS. The result is shown in **Figure 6.2.7**.





Use of DGPS was analyzed by the Type and GT of Ship.





Figure 6.2.8. Ships having Experience to Utilize DGPS by Type

Ships having experience to utilize DGPS by the GT

According to the GT of ships, only 26.6 % of respondents have experience of using DGPS and the ship which have the highest percentage of using DGPS was ships of GT more than 50,000 ton(63.2%), and followed by "GT 10,000 - 50,000" (37.8 %) and "GT 3,000 - 10,000" (31.8%).

The detailed ships by GT that have experience of using DGPS is shown in **Figure 6.2.9**.



Figure 6.2.9. Ships ever Experienced to Utilize DGPS by GT

(4) Intention for a utilization of DGPS

Opinion about the DGPS in Indonesia

With regards to the implementation of DGPS in Indonesia, most of respondents (72%) have the opinion that DGPS should be implemented in Indonesia, 22% of respondents answered not necessary and 6 % gave no responses. The answers from respondents are shown in **Figure 6.2.10**.

Figure 6.2.10. Opinion about the Implementation of DGPS in Indonesia



Ships by type that gave opinion about the use of DGPS

72% of respondents said that DGPS should be operated in Indonesia. And especially all four ships of ore carrier, all seven ships of offical ship and barge, only one ship of dredger answerd that DGPS should be implemented.

Ships by type which gave the respondents about the implementation of DGPS in Indonesia is shown in **Figure 6.2.11**.





Opinion about the implementation of DGPS in Indonesia by GT Most of ships (72.0%) answered that DGPS should be implemented in Indonesia and 89.5% of ships answered "yes" were ships of more than 50,000 GT and followed by "GT 500 - 3,000" (82.1%) and "GT 300 - 500" (79.8%).

Opinion about the implementation of DGPS in Indonesia by the GT is shown in Figure 6.2.12.

Figure 6.2.12. Opinion about DGPS in Indonesia by GT



It is arranged as follows:

- a. 900 ships (74.1%) out of 1215 respondents were equipped with GPS receiver, and 323 ships (35.9%) of them had experienced to use DGPS.
- b. 305 ships, that is 94.4% of those who experienced to use DGPS, answered that DGPS should be implemented in Indonesian waters.

Useful area of DGPS

Among the respondents who answered the usefulness of DGPS, a total of 34.0% state that DGPS is useful in narrow channel, 28.5% state it is useful on Port/Harbor area and 25.3% state it is useful at congested area. **Figure 6.2.13.** shows the respondents' answer :



Figure 6.2.13. Usefulness of DGPS N=523

Opinion about the Desirable Accuracy of Positioning

A total of 231 respondents gave their opinion about the desirable accuracy for positioning, 55.4% indicated the accuracy between 5 - 10 m, 15.2% wanted the accuracy between 20 - 50m.

Respondents' opinion is shown in Figure 6.2.14. and Appendix 6.2.3.

Figure 6.2.14. Opinion about the Desirable Accuracy of Positioning

N=231



(5) Other results of the questionnaire are shown by figures. Crew on Board

The crew on board is shown on **Figure 6.2.15**.





Ships engaged in international/domestic voyage

From **Figure 6.2.16**., 28% of respondent are engaged or experienced in international voyage, and the test 72% are engaged only in domestic voyage.

Figure 6.2.16. Engaged in International/domestic voyage N=1215

 Ships Sailing at Night

Sailing time is one of the important factors. Among the respondents to the questionnaire, a total of 90% of ships sail day and night, and only 10 % sail only in the daytime.

Result is shown in **Figure 6.2.17**.





Number of Time for Ship Passing Through Certain sea lane

Figure 6.2.18. shows the busiest sea lanes. They are 3 Indonesian SeaLanes (ALKI 1, ALKI 2 and ALKI 3) and Malacca & Singapore straits.a. Malacca & Singapore straitsb. Sea Lane(ALKI No. 1)

81	,
c. Sea Lane (ALKI No. 2) d. Sea Lane (ALKI	No. 3)

Figure 6.2.18. Most of passing Sea Lane



Total ships passing through each sea lane in a year are shown in **Figure 6.2.19**.



Figure 6.2.19. Ships Passing Through Each Sea Lane

The result shows that the most often used sea lane is the Sea Lane and . Usage frequency are 34% and nearly same in both lane. The Sea Lane is passed by the ships of 9.2% and Malacca / Singapore Straits is 22.5% of ships.

Information about Weather Condition

Weather information is very important for ships before and during sailing.

Most of ships get information about weather condition by Radio, Television and Fax. Only several ships get information from public telephone, portable phone or internet.

Figure 6.2.20. shows the equipment to get the weather information.





Electronic Equipment on Board

Generally, a modern ship has more than one system of electronic navigation equipment on board such as Loran C receiver, GPS receiver, ECDIS, Radio direction finder, Radar, etc.

For electronic equipment on board, according to the answer from respondents is shown in **Figure 6.2.21**.

Others ECDIS Loran C Receiver 1% Telex 1% Fax 8% **GPS** Receiver 7% 22% Portable Phone 5% Mar Mob Radio telephone 6% Radar 18% VHF Radio **Radio Direction** Telephony Finder 23% 8%

Figure 6.2.21. Electronic Equipment on Board

N: Total No. of equipment =3850

Frequently used port by respondents

Ports used by respondents were surveyed by domestic and international voyage respectively.

a. Domestic Port

The most frequently used by respondents are Surabaya and Tanjung Priok, and used by 7.6% and 7.4% of respondents respectively. Details are shown in **Appendix 6.2.4**.

Since there were a small amount responses came from eastern part of Indonesia, number of the ports in east Indonesia was shown very few.

b.International Port

The respondents showed that the most frequent call port of foreign country was Singapore (32.3%), followed by Malaysia (6.0%), and Japan (5.7%).

The details of international frequent calling ports in foreign countries are shown in **Appendix 6.2.5**.

Main Navigation Route

For the main navigation route, respondent shows that the most frequently used route is Java Sea. 29.1% of respondents are using this route, and other route are Makassar Strait (8.4%), Malacca Strait (7.0%) and South China Sea (6.2%)

From all respondents, 40.9 % of all ships are passing through 4(four) main routes and 59.1 % are passing other 239 route. The details are shown in **Appendix 6.2.6**.

Area of navigation difficulty

Because of geographic condition and other reasons, ships sometimes feel difficulty for sailing at certain area. According to the respondents' answers, the following areas are the places where they feel much difficulty for navigation.

a. Kuala Jelai, total 39 answers

b. Bangka Strait, total 34 answers

c. Malacca Strait, total 30 answers

d. Musi River, total 16 answers

e. Java Sea, total 15 answers

Detailed information about the location of navigation difficulty is shown in **Appendix 6.2.7**.

Sea Disaster

Sea disasters sometimes involve ships during sailing. From the questionnaire, a total of **48** ships (4.2%) have experienced sea disaster. the causes of the sea disasters are bad weather (1.5%), followed by engine troubles (1.0%), wrecked (0.7%) and other causes(1.0%) . **Appendix 6.2.8**. shows the details.

6.2.4. The Future of DGPS after the Abolition of SA(Selective Availability)

With the removal of SA, some authorities questioned the continuing operation of DGPS. Accordingly International Association of Maritime Aids to Navigation and Lighthouse Authorities (IALA) has reconfirmed as a matter of policy the need to continue the operation of DGPS. Followings are the documents published by IALA.

(1) Draft Policy Paper on the Future of the Marine LF/MF Differential Global Navigation Satellite System (DGNSS)

March 8, 2001

Background

The purpose of this paper is to provide information on future directions and emerging technologies regarding the provision of marine radionavigation services to SOLAS and non-SOLAS vessels.

IALA will need to continue to take an active role in the development of future maritime radionavigation policy as it is affected by these emerging technologies. Maritime navigation technology is currently centred around the marine LF/MF DGNSS system which is composed of the following:

a. Satellite constellation (GNSS, comprising GPS and GLONASS)

b. Land based transmitting site (DGNSS)

c. User receiver (receives both GNSS and DGNSS signals)

The paper addresses the evolving technology that will affect all three components of the present marine LF/MF DGNSS system over the next fifteen years. This document is based on current information provided to the RNAV Committee by its members and is subject to change due to ongoing development.

Currently, many IALA members have already installed or are planning to construct DGNSS stations.

However, with the removal of GPS Selective Availability (SA) in May 2000, some users and National Authorities questioned the continuing requirement for DGNSS. This question was prompted by the improvement of GPS accuracy from 100m(with SA) to approximately 15-25m(without SA).IALA has already reaffirmed as a matter of policy the need to continue to maintain and develop DGNSS services because of the current IMO requirements for 10m position accuracy (95%) and 10 second integrity warning (of satellite malfunction) for navigation in harbour entrances/approaches and coastal waters for SOLAS vessels.

The continuing need for DGNSS is further reinforced as it provides vital input for the proper operation of ECDIS (Electronic Chart Display Information System), ECS (Electronic Chart System) and AIS (Automatic Identification System).

TECHNOLOGY IMPROVEMENTS:

With the termination in May 2000 of the accuracy degradation of GPS

that was caused by Selective Availability, the IALA Radionavigation Committee has identified five possible routes for development:

- a.Reduction of the data rate used for the broadcast of DGNSS corrections.
- b.Reduction of the frequency of transmission of DGNSS correction messages.
- c. Addition of new messages containing phase corrections that would make sub- meter accuracy possible.
- d.Addition of messages containing meteorological or hydrographic data.
- e.The broadcast of ionospheric corrections derived from wide-area model rather than the values obtained at local broadcast sites alone.

(2) IALA Recommendation R-121 June 2001

Recommendation on the Performance and Monitoring of DGNSS Services in the frequency band 283.5-325 $\rm kHz$

A Global Navigation Satellite System (GNSS), currently GPS and GLONASS, is a space-based positioning, navigation and time distribution system designed for world wide use.

Differential GNSS (DGNSS) is a means of improving the accuracy of GNSS and providing integrity monitoring to the civil user. DGNSS involves having, at precisely known locations, reference stations that provide real-time corrections to the GNSS signals and integrity monitoring.

This Recommendation describes the use of transmitters in the 285-325 kHz/283.5-315 kHz LF/MF marine frequency band to transmit DGNSS. It must be noted that DGNSS is an augmentation of GNSS and is not a stand-alone radio navigation system.

The removal of Selective Availability (S.A.) in May 2000 does not remove the requirement for GNSS augmentation. Without augmentation GNSS accuracy may contain significant errors for extended periods of time and no integrity information is provided.

Although this may be acceptable for some users, such as fishermen and pleasure boat owners, it is not acceptable for merchant vessels, normally operating with tighter safety margins and higher risks.

On the other hand, the removal of S.A. enables the operator of a DGNSS

service to reduce the data link data rate, which brings about several advantages.

6.2.5. Conclusion

- With regards to the implementation of DGPS in Indonesia, all ships of 72% and the ships with experience of DGPS of 94.4% want to implement DGPS. And when ships fix their position, the accuracy of 5-10m is desired by the majority.
- (2) It is concluded that the necessity of DGPS should be examined through the careful study on needs of mariners, integrity of the system and international trends.

CHAPTER 7.

PROGRESS OF REGIONAL AUTONOMY

CHAPTER 7. PROGRESS OF REGIONAL AUTONOMY

7.1. Present Status

7.1.1. Background of Regional Autonomy and Progress of Implementation The Republic of Indonesia is an archipelago state with local diversity, and is a county of multi-ethnic nation constituted by different races. Suharto Regime that lasted for 32 years had maintained development and unification of the nation by enforcement of the uniform policy, which was formed by the centralization-of-power organization where the President being at the helm. However, increasing top-down uniform policies by the centralization system, which disregarded the diversity of an area, had suppressed local governments to demonstrate independence and to improve administration capability. Application of uniform policy and capture of the resources income of the local districts by the central government have accumulated local dissatisfaction.

The Asian financial crisis, which started in 1997, had big influence on Indonesia, and the breakdown of the economy by sharp fall of the currency brought about social unrest. The Suharto Administration was exposed to criticism that crony capitalism, which appointed relatives and followers to positions of trust caused the crisis, and they were obliged to resign after the big riot in Jakarta, occurred in May 1998. After the Suharto Administration breakdown, President Habibie promoted from the Vice-President and addressed his Cabinet as "political reform / development government", in order to secure the legitimacy of political power. Then, he suggested "political reform / democratization policy" for impressing farewell from the Suharto era. The reform under the Habibie Administration included the breakaway from the organization under the old Suharto Administration, freedom of speech, promotion of democratization, conversion to the administration with high transparency and accountability from adhesion, corruption and cronyism (KKN), and conversion of a development paradigm called promotion of democratic development instead of top-down centralized development.

Under the above reforms, the revision of three political-related Bills (the Political Party Law, General Election Law, National Conference, Parliament and Local-assembly Members Law) were made in January 1999. The general election was held in June in a free and fair form under the participation of 48
political parties. Meanwhile, in May 1999, two regulations, Local Administration Law (Regulation No. 22 in 1999) and Financial Balance Law between Central Government and Local Government (Regulation No. 25 in 1999) were enacted, and a big change was made to the old relation between Central Government and Local Government.

Independent movements also continue in Aceh region and Irian Jaya region following the approval of the independence of East Timor, and unstable conditions in local districts still remain such as a riot in Maluku Province. Moreover, regions, which produce natural resources, such as East Kalimantan Province and Riau Province, are requiring more reasonable distribution of profits, and their autonomy.

Implementation of decentralization is an important policy to avoid national division and maintain unification as well as to promote democratization.

Though President Megawati was inaugurated in July, 2001 after the downfall of former President Abdul Wahid due to the riot against his policy, the above decentralization policy will be maintained.

7.1.2. Change of Relationship between Central Government and Regional Government

The following 3 items are pointed out as main characteristics of the Local Administration Regulation No.22 in 1999, which stipulates relations between central government and regional governments:

1) Cutting down of central government power and transferring it to regional governments.

2) Paralleling the relationship between regional and municipal government3) Checking and balancing with administration by strengthening the power of regional assembly.

Firstly, the regulation limited the functions of the central government to the fields of diplomacy, defense and securities, judicature, monetary and finance, religion and other specialized fields. Any other functions except the above fields should be transferred to local government, especially Prefecture (Kabupaten) and City (Kota). The central government concentrates its activities on establishing macro policy and making the national strategy; in such context, local offices belonging to central departments are to be integrated to regional governments and municipal governments.

The functions of local offices of central government at the level of prefecture and municipality are withdrawn and are performed by regional government. In this regard DGSC is responsible for planning, development, operation and management of aids to navigation and maritime telecommunication. In addition to that, all district navigation officers are under DGSC control.

Secondly, prefectural and municipal governments will become the center of decentralization. Prefectural Governor (Bupati) and Mayor (Walikota) are elected by the Prefectural Assembly and Municipal Assembly and have no interference from the central government. They themselves carried out development plan and budget, which were made by regional governments, when regional assemblies accepted them.

Limited autonomy is given to Provinces. Autonomy covers wide administrative areas across prefectures and cities. The Provincial Governors are selected by Provincial Assemblies and are appointed by the President. Therefore the Provincial Governors have functions of not only as the heads of provinces but also as the representatives of central government. Also provincial governments have functions of supervising and monitoring prefectural and municipal governments, but the relation with prefectural and municipal governments will be independent and not hierarchical.

Thirdly, the Local Administration Law strengthens the power of Regional Assemblies function and gives the right of monitoring the local administrations. The assembly selects the head of the region and the head has responsibility for the local assembly. The plan, policy and budget proposed by the local government need the approval of local assembly. And also the governor has to make responsible speech every year and should get the approval of local assembly.

The governor has a right to make speech again when the first speech was not approved, but the assembly has a right to propose the dismissal of the governor to the President when the assembly denied his speech twice.

In such big change of the relation between the central government and local government, there is some fear if the local governments are able to carry out their functions fully; it is a big issue to improve administration ability of the local governments. And also, there are some problems such as some central governments staffs have hesitation against a transfer to local governments and how to treat the generation of surplus personnel.

Further more, in relation between the local government and the local assembly, the lack of experience of local assembly members and their abilities are pointed out and it is needed to improve their ability. And it is worried that the corruption expands to the region due to decentralization. It

is a big problem that local government should improve clearness on policy making and administration procedure and should establish good governance.

7.1.3. Change of a Local - Public - Finance System

As for the local public finance of Indonesia, the financial transfer to the local government has so far been made by various kinds of grants and subsidies, which are budget for limited use given by the central government. According to the Regulation for the Financial Balance between Central Government and Local Government (regulation No. 25 in 1999), the incomes from natural resources are distributed from the central government to the local government. And the regulation also has specified how the local government's source of revenue is filled up through the financial transfer from the central government, and balance shall be kept on. The local government's source of revenue consists of the self-income (PAD), balanced fund, loan, and other incomes. Balanced fund is constituted by a land-andbuilding tax, a land-and-building transfer tax, local government share of the revenue distribution from natural resources, general subsidy with which the purpose for spending is not limited (Dana Alokasi Unum: DAU), and the special subsidy with which the purpose for spending is limited (Data Alokasi Khusus: DAK). The income from natural resources will be distributed as shown in **Table** 7.1.1.

Table 7.1.1. Distribution of the Income from N atural ResourcesUnit : (%)

							()
	Befe	ore		After imp	olementation	of the regulati	ion
Kind of tax	Central	Local	Central	Region	Prefectures of production	Vicinity** Prefecture	All Prefectures
Petroleum	100		85	3	6	6	
Gas	100		70	6	12	12	
Non Petroleum Gas : land rent	20	80	20	16	64		
Non Petroleum Gas :interests	20	80	20	16	32	32	
Fishery	100		20				80
Forestry : land rent	30	70	20	16	64		
Forestry : land rent for use	55	45	20	16	32	32	
Plantation fund*	100		60		40		

* 40% of plantation fund is distributed to the prefecture of production as special subsidy

** Vicinity prefectures mean the ones except prefecture of production within the region

Although the natural-resources income distribution to the local government has been expanded, the rate of distribution is different among local governments depend on the rate of natural resource productivities. The financial transfer from the central government as the general subsidy and the special subsidy shall attain balancing of local public finance. The general subsidy is stipulated to be at least 25% of the central government's national annual revenue, which is to be allotted to local government, and 25% to provinces and 22.5% to prefectures and municipalities are to be allotted. It is provided that the general subsidy is distributed so that local government's revenue needs and financial capability may keep balance.

Although the amount of the general subsidy to a prefecture and a municipalgovernment prefecture, whose purpose for the use is not determined yet will increase. So as a matter of fact, however, much of the subsidy goes to the routine budget such as personnel expenditures for officials and there are few portions that can be used as development budget. Therefore, it is necessary for them to make efforts to increase their self-income. The central government revised the old Local Tax regulation (Regulation No. 18 in 1998) to new Local Tax Regulation (Regulation No. 34 in 2000). Under the new Local Tax Regulation, it is possible for a local government to impose new tax and surcharge unless it violates higher laws. However, it is also anticipated that the establishment of new tax and surcharge produces a bad influence on investment, and it is necessary to reexamine the state of local public finance including review of DAU distribution, rationalization of the organization and personnel of the local government, and methods of providing public services.

7.2. Government Policy

7.2.1. Regional Autonomy Implementation Laws and Governmental Regulations

The situation of the governmental regulations was regarding the two decentralization laws.

With the implementation of decentralization, relevant governmental Regulations (PP) should be established in order to specify more concrete contents of decentralization stipulated in the Local Administration Law and the Law for the Financial Balance between Central Government and Local Government. The government has been making the governmental regulations during the preparatory period from the promulgation of the Laws to their enforcement, but all the needed the governmental regulations have not been completed yet. The situation of preparing the governmental regulations about decentralization is as shown in **Table 7.2.1**.

Item	Governmental regulation and the presidential Decree
1.Authority	Governmental regulation No.25 (2000): Authority of Central and Provincial
	Government
	Presidential Decree No.5 (2001): Authority of Prefectural and Municipal
	governments
2.Organization	Governmental regulation No.84 (2000):Organization of regional government
	Presidential Decree No.151 (2000): Working Group for Autonomy Council
	(DPOD)
	Presidential Decree No.157 (2000): Working Group between ministries
	Governmental regulation No.108 (2000): Accountability of Heads of Regional Government
	Governmental regulation No.109 (2000): Budget for prefectural governors,
	etc
	Governmental regulation No.110 (2000): Budget for regional assembly
	Presidential Decree No.1 (2001): Procedure of regional assembly
	Presidential Decree No.6 (2001): Establishment of regional assembly after
	1999
3.Personal	Governmental regulation No.96 (2000): Appointment, Transposition and
affairs	Dismissal of staffs
	Governmental regulation No.97 (2000):Organization of central government
	staffs
	Governmental regulation No.98 (2000): Employment of central government staffs
	Governmental regulation No.99 (2000): Promotion of central government
	staffs
	Governmental regulation No.99 (2000): Appointment of manager of central
	government staffs
	Governmental regulation No.99 (2000): Education and training of central
	government staffs
	Presidential Decree No.5 (2002): Establishment of regional personal
	affairs agency
4.Finance	Governmental regulation No.104 (2000): Fund for financial balance
	Governmental regulation No.105 (2000): Management of regional finance
	and accountability
	Governmental regulation No.106 (2000): Financial management and
	accountability
	Governmental regulation No.107 (2000): Ioan by regions
	Governmental regulation No.2 (2001): Transfer of assets from the central
	government to regional government

 Table 7.2.1. Main Governmental Regulation and Presidential Decree

The governmental regulation No.25 was proclaimed in June 2000 regarding to the transfer of authority, and the regulation of the authority of the government and provincial government was made.

Because the governmental regulation was regulated in the form of the negative list excluding the authority of prefectural and municipal governments, then so there were many requests from prefectural and municipal government for the form of the positive list, which specified their authority. The government made the positive list concerning 11 authorities.

Furthermore, each central ministry agency sets up the minimum service standard, and each provincial government decides the minimum service standard of the prefecture based on it. And thereby, the prefecture and the city are going to calculate the cost of service. However, It is still at the stage of waiting for the establishment of the standard by the central ministries.

About the local government's organization, the guideline about a local government organization mechanism was shown by the governmental regulation No.84 in 2000, and the local government made the reorganization proposal of the government organization, presented to the local assembly. In the meantime, the central government implemented reorganizations according to the function of each ministry and agency. The regulation about a district head's accountability will be stipulated in the governmental regulation No.108 in 2000, and a responsible speech will be made by the to head to the local assembly during three months (January - March) after the end of the fiscal year.

About government official personnel affairs, the Government Decrees; governmental regulation No. 96 to No.100 were proclaimed. However, since they have the points contradictory to the Law No. 43, the revision is expected. Meanwhile, in governmental regulation No.101, State Personnel Institution (BKN) carries out management of education and training and National Institute of Administration (LAN) carries out the practice of education and training. BKN has the responsibility for selection standard for candidates of training and application after training and LAN has the responsibility to develop the training curriculum. Number of the government officials transferred to the local governments from the central government with decentralization amounts to 1,975,000 people. Number of the government officials for transfer (about 1,500,000 people) will be checked by the local governments.

About local public finance, five related government regulations were proclaimed, however the laws and institutions about local-public-finance information has not been proclaimed yet. Under the governmental regulation No.107 in 2000, the local government can ask for a loan from a foreign country or local government's direct loan. However, the 2001 fiscal year, since the Indonesian economic power is still weak, the notification that a loan from a foreign country is not permitted, is addressed by the Economy Adjustment Minister. The central government budget (total 315,750 billion Rupiahs) is approved by Parliament and among it the transfer to the local government is 81,676 billion Rupiahs (items: tax revenues of 20,259 billion Rupiahs, General Allocation Fund of 60,517 billion Rupiahs (DAU), Special Allocation Fund of 900 billion Rupiahs (DAK). Area Income and Expenditure (APBD) of a prefecture and a city will be determined after the assembly's recognition by many local governments on the contrary, the revision (regulation No.34 in 2000) of Local Tax Law, which leads big influence on the local government's self-income was made (refer to **Table 7.2.2**. for the kind of local tax). Prefecture and city government can prepare a new tax on the basis of conditions following to public profits and public regional economy. In the meantime, when a taxable item straddles two or more prefecture and cities, the authority of re-distribution of a prefecture and city tax revenues is granted to the region governor.

	Item of tax	Rate of tax	Distribution of tax income
u	1. Vehicle with motor	Less than 5%	Over than 30% to prefecture and city
gio	2. Transfer of name	Less than 10%	Over than 30% to prefecture and city
Seg	3. Fuel for vehicle with motor	Less than 5%	Over than 70% to prefecture and city
I	4. Underwater	Less than 20%	Over than 70% to prefecture and city
	1.Hotel	Less than 10%	Over than 10% to village
ė	2.Restraunt	Less than 10%	Over than 10% to village
y tu	3.entertainment	Less than 35%	Over than 10% to village
Cit	4.Advertisement	Less than 25%	Over than 10% to village
rei	5.Street light	Less than 10%	Over than 10% to village
Ц	6.mining mineral	Less than 20%	Over than 10% to village
	7.Parking	Less than 20%	Over than 10% to village

Table 7.2.2. The Kinds of Local Tax

7.2.2. Schedule of Regional Autonomy

Local Autonomy Consulting Committee (DPOD) was set up by the Presidential Decree No.52, 2000 in April 2000, and 6 working groups under DPOD including 1) Distribution of authority, 2) Reorganization, 3) Shift of officials, 4) Financial management and transfer of assets, 5) Transfer of documents and 6) Capacity building.

DPOD was set up by the Presidential Decree No.52, 2000 as the assisting agency concerning new building and integration of local governments, financial relation between the central and local government and ability of local government in order to promote decentralization.

The members of DPOD consist of the Minister of Interior, the State Minister of Finance, the State Minister of Defense, the State Minister for Utilization of State Apparatus (MENPAN), the Chief of Cabinet, the chief of Institute of National Development Plan and the representatives of regional governors committees.

The Chairman of Prefecture Governor Committee, the Chairman of Mayor Committee, and two representatives of region, prefecture and city respectively are added. The secretariat of DPOD is the General Chief of Local Administration Agency in the State Ministry for Home Affairs.

In the Consultative Group on Indonesia (CGI) held in Tokyo in October 2000, The State Minister for Domestic Affairs showed the following schedule of decentralization mentioned in the **Table 7.2.3**. DPOD is going to monitor the condition of decentralization by local government and after year 2004, to adjust the number of provinces, prefectures and cities by abolition of local government that has no ability to carry out decentralization and integration of local governments in the vicinity.

Time	Stage	Contents
By	Preparation for	*Enactment of Governmental regulation
Jan.2001	decentralization	
2001	Commencement of	*Completion of decentralization
	decentralization	
2002-	Improvement of	*Completion of decentralization of remaining regions
2003	decentralization	*Improvement of ability of regional government
2004	Reinforcement of	*Improvement of strategy and concept of decentralization
2004-	decentralization	*Removal of the gap between concept and law skeleton
2007		*Abolition and integration of regional government
After	Stability of	Continuous improvement of decentralization
2007	decentralization	-

Table 7.2.3. Practical Schedule of Decentralization

7.3. Japan's Assistance

Japan is supporting mainly the local government's personnel training to improve the local government's administration capability and district development policy. Assistance to the local governments concerning district development policy by sending specialists to District Development Department in the State Ministry for Domestic Affairs, Institute of Province Development Plan (BAPPEDA) and Institute of National Develop Plan (BAPPENAS), improvement in capability and consciousness reform of the local government personnel such as the head of district and the personnel of BAPPEDA, the secretariat personnel through the domestic training, and promotion of consciousness reform of the prefectural governors and mayors through training have been carried out. Moreover, reinforcement of training system for the local civil servants by the improvement project in local civil servant administration capability and personnel training are planned in the fiscal year 2001.

In the fields, such as local administration, local public finance, and local assembly, the future assistance of Japan were studied and were made a course in the fiscal year 2000, and Japan is required the broad synthetic support for the promotion of the decentralization which is the important policy in Indonesia.

However, on the other hand, as a result of implementation of decentralization, transfer from authority of central government to local government, reduction of the central government function, and transfer of the central government personnel to the local government, the present assistance system which has been carried out by the central government as main "counter parts" will be much influenced. As for technical cooperation, there is a possibility of transfer from the central ministries to the local government. Much more cooperation will be further required with the local government, the local government's personnel training, adjustment between the central government and the local governments reservation, and strengthening management ability of the local government. The improvement in capability of the local government is definitely necessary for the adjustment between the central government and the local government, and maintenance and management. Moreover, it is expected that the issues required from the local government will increase in the future. And then flexible response to the individual various issues will be necessary to cope with new schemes.

7.4. Other Donors' Trend

7.4.1. Dautsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GTZ is carrying out the decentralization support project (SFDM) from 1994, and advising the direction of decentralization of Indonesia, mainly to the Ministry of the Interior Local Administration Department (PUMDA, past PUOD), especially about enactment of local administration law and governmental regulations. In response to the request of BAPPENAS, Capacity Building Needs Evaluation Investigation (CBNA) was carried out for one year from November 1999 and analyzed the following six (6) issues to grasp current situation and analyzed the problems for capability improvement. 1) The functions and roles of local assemblies. 2) Provision of public service (city service, health, education, agriculture.) 3) Community development plan. 4) Local public finance. 5) Personnel management. 6) Organization development.

7.4.2. Asian Development Bank (ADB)

Asian Development Bank (ADB) is carrying out Community and Local Government Support: Sector Development Program(CLGS: SDP) and is offering technical cooperation concerning the following three (3) fields, 1) the program loan of 200 million dollars for supporting a governmental decentralization policy and administrative reform. 2) the project (investment) loan for the poverty mitigation by the employment promotion through labor-intensive public works, and minor and small business support. 3) Prefecture administration system, prefecture financial system, project development of participation type monitoring and an evaluation program. Moreover, the technical cooperation is also carried out for improving procurement capability of the local government, which is needed along with decentralization.

7.4.3. United Nations Development Program (UNDP)

UNDP is carrying out the Partnership for Governance Reform in Indonesia Project in collaboration with the World Bank and Asian Development Bank. This partnership tends to carry out technical support relevant to the reform of governance including decentralization based on trust fund. The purpose of partnership consists of. 1) Collection and the spread of good practice in connection with governance, 2) Adjustment among the government, donor, and civil society 3) Financial support for promoting governance reform which focuses on the following eight fields: 1) Corruption prevention, 2) Enterprise governance, 3) Local autonomy and decentralization. 4) Government official system reform, 5) Judicial reform, 6) Election reform, 7) Parliamentary strengthening, 8) Strengthening of civil society and media. From the circumstances that supported the general election in June 1999, UNDP is supporting focusing parliamentary (Parliament and local assembly) capacity building and strengthening of civil society. Moreover, in partnership, UNDP is also supporting the training of the facilitator of the district on decentralization and implementation of decentralization by the local government.

7.4.4. United States Agency for International Development (USAID) USAID is supporting Regional Program for City Development (PDPP) in the CLEAN-URBAN project, which is offering the support for local-publicfinance management. The project stations specialists in the Ministry of Finance, and is supporting in the field of local public finance. Moreover the training program about the district public investment plan for the local government is carried out under the cooperation between the Institute of Technology Bandung and University of Southern California.

7.4.5. Canada International Assistance Agency (CIDA)

CIDA has stationed the specialist in BAPPENAS and has offered support for development projects. About decentralization, CIDA stations the following advisers for political supporting.

(1) Advisor of decentralization in the Planning Bureau of Autonomy in the State Ministry of Domestic Affairs.

(2) Adviser of personnel policy in BKN

(3) Advisor of training plan in LAN

7.4.6.The World Bank

The World Bank is performing the policy dialog with the central government in relation to local public finance and the local government official reform about decentralization. Moreover, a state health project is carried out in health field, and decentralization in health sector is supported.

CHAPTER 8.

SOCIO-ECONOMIC FRAMEWORK AND FUTURE DEMANDS

CHAPTER 8. SOCIO-ECONOMIC FRAMEWORK AND FUTURE DEMANDS

8.1. Macro-economic Framework

The macro-economic framework is meant to provide a description on the short and medium term economic prospect.

For recovering from economic crisis, GOI consulted and agreed with IMF on LOI. GBHN had been decided based on LOI in October 1999 and PROPENAS, which is established by GBHN, is a new development plan replacing by REPELITA through 2000 to 2004.

By PROPENAS, in the short term, macro-economic policy is directed at economic recovery and in the medium term, macro-economic policy is aimed at strengthening the base for sustainable and equitable development.

Main macro-economic framework by PROPENAS is shown in **Table 8.1.1**.

Terditerter	1000			Projection			
Indicator	1999	2000	2001	2002	2003	2004	
Inflation rate (%)	2.0	7-9	6-8	5-7	4-6	3-5	
	7 000	7,000 -	7,000 -	6,500 -	6,500 -	6,500 -	
Exchange Rate (Rp/US\$)	7,809	8,000	8,000	7,500	7,500	7,500	
Economic Growth (%)	0.3	4-5	4.5-5.5	5-6	6-7	6-7	
GDP per Capita							
Nominal (US\$)	691	760	912	1,011	1,196	1,312	
Real (Rp. Thousand)	4,785	4,929	5,111	5,328	5,583	5,873	
Current Account Deficit /	4.0	4.8	3.7	1.8	0.0	-1.1	
GDP (%)							
Government Debt Stock /							
GDP (%)	101.2	99.2	86.3	76.3	63.9	45.7	
Foreign Loan (%)	46.3	48.6	41.1	35.5	28.5	24.8	
Domestic Loan (%)	54.9	50.5	45.2 40.7		35.4	20.8	

Table 8.1.1. Macro Economic Framework

Source; PROPENAS

8.1.1. Population

According to the Statistic Indonesia by BPS, projected population in 2004 is 222,696.7 thousand.

In the meantime, according to World Bank (Indonesia Accelerating Recovery in the uncertain times, October 13, 2000), population grew by 2.39% per year during the 1971-1980 periods, 1.97% per year during the 1980-1990 periods, 1.59% per year during the 1990-1999 periods. The increasing rate decrease annually 0.04% for

past 29 years. Forecast in the target year 2007 and 2020 are estimated respectively by above increasing rate considering above decreasing 0.04 %, same as the past 29 years. It is shown in **Table 8.1.2**.

PROVINCE	2007	2020	PROVINCE	2007	2020
Dista Aceh	4,674.8	5,389.2	Karimantan Barat	4,492.4	5,245.8
Sumatera Utara	13,500.4	15,563.3	Karimantan	2,047.2	2,452.6
			Tengah		
Sumatera Barat	5,062.5	5,615	Karimantan	3,500.6	4,035.6
			Selatan		
Riau	5,035.3	6,189.3	Karimantan Timur	3,101.5	3,961.2
Jambi	3,014.2	3,657.8			
Sumatera Selatan	8,716.3	10,048.1			
Bengkulu	1,868.2	2,386.2			
Lampung	7,815.9	8,668.9			
Sumatera TTL	49,687.6	57,517.8	Karimantan TTL	13,141.7	15,695.2
DKI Jakarta	10,497.6	11,493.9	Sulawesi Utara	3,090.2	3,427.2
Jawa Barat	48,424.5	57,277.3	Sulawesi Tengah	2,517.8	3,134.5
Jawa Tengah	33,784	36,990.3	Sulawesi Selatan	9,111.3	10,503.5
DI Yogyakarta	3,322.2	3,637.7	Sulawesi Tenggara	2,019.5	2,419.3
Jawa Timur	37,661.2	40,183.5			
Jawa TTL	133,689.5	149,582.7	Sulawesi TTL	16,738.8	19,484.5
Bali	3,356.6	3,722.9	Maluku	2,424	2,620.1
Nusa Tenggara Barat	4,506.3	5,398.8	Irian Jaya	2,615.8	3,383.7
Nusa Tenggara	4,371.7	5,105			
Timur					
Timor Timur	1,071.1	1,299.9			
Nusa Tenggara TTL	13,305.7	15,526.6	Maluku dan	5,039.8	6,003.8
			Irian Jaya TTL		
			Indonesia TTL	231,603.1	263,810.6

Table 8.1.2. Population Projection

Unit: thousand persons

Source: 1) Statistical Year Book of Indonesia, 1999 2) Indonesia, In Figures, 2000

8.1.2. GDP

According to the Statistic Indonesia by BPS, GDP grew 7.5 % in 1994, 8.2 % in 1995, 7.8 % in 1996, 4.7 % in 1997, 13.1 % output loss by economic crisis in 1998, 0.8 % in 1999, 4.8 % in 2000. GDP Growth Rate (PROPENAS, Actual, Estimate) is shown in **Table 8.1.3**.

Indonesia seems to regain political stability by the birth of the Megawati Administration and the nascent recovery gained strength during the recent year. Forecast in 2007 and 2020 is estimated by figures of PROPENAS during the year 2000-2004, by 6.5 % during the year of 2005-2020 in Likeliest Case, +1.5 % in Optimistic Case and -1.5% in Pessimistic Case, which are shown in **Table 8.1.3**. Before formulation of PROPENAS, Indonesia had formulated REPELITA. GDP Growth Rate by REPELITA seems to be rather bigger in this stage, figures of optimistic case are rather near GDP Growth Rate by REPELITA.

					Unit: %		
				Estimate	ite		
Year	PROPENAS	Actual	Likeliest	Optimistic	Pessimistic		
			Case	Case	Case		
1994		7.5					
1995		8.2					
1996		7.8					
1997		4.7					
1998		-13.1					
1999		0.8					
2000	4.5	4.8					
2001	5		5	6.5	3.5		
2002	5.5		5.5	7.0	4.0		
2003	6.5		6.5	8.0	5.0		
2004	6.5		6.5	8.0	5.0		
2005-2007			6.5	8.0	5.0		
2007-2020			6.5	8.0	5.0		

Table 8.1.3. GDP Growth Rate

Source: 1) PROPENAS

2) Indonesian Financial Statistics, April 20013) Statistical Year Book of Indonesia, 1999

According to GDP Growth Rate in Table 8.1.3, GDP in 2007, 2020 shall be projected in Table 8.1.4.

Tabl	e 8.	1.4.	GDP	Proi	ection

Unit: Billion Rupiah												
Year		GDP										
	Likeliest Case	Optimistic Case	Pessimistic Case									
2007	603,544	665,842	546,310									
2020	1,368,526	1,810,840	1,030,148									

8.2. Future Demands

Future demands shall be calculated by the following methodology, since there is close correlation between social indices shown by socio-economic framework and sea-borne cargo volume.

8.2.1. General Formula

Generally the correlation between GDP and cargo volume is expressed by the **formula 8.2.1**.

T = **a***GDP^e (formula 8.2.1.) T : Total Cargo Volume (tonnage) **a** : Constant GDP : Gross Domestic Product

e : Elasticity coefficient

(elasticity fit between 0.8 to 2.0. It is usual that 0.8 is adequate for an industrialized country, $1.0\sim2.0$ for developing country. 1.5 is fit for developing country)

The future total sea-borne cargo volume is predicted from the calculation of the approximate expression of **formula 8.2.1**. based on the past data.

8.2.2. Interisland Cargo Volume

The Interisland cargo volume between 1989-1998 is shown in **Table 8.2.1**. By the regression analysis of correlation between GDP and cargo volume as shown in **Table 8.2.2**, the **formula 8.2.2**. is obtained.

Y = 1.6133 × - 3.8831 (formula 8.2.2.) R2 = 0.9337 Where, X : Log(GDP) Y : Log (Cargo)

The elasticity resulted to be 1.6133. Considering that Indonesia is a developing country, this can be regarded as a reasonable figure.

Table 8.2.1. Interisland Unloaded and Loaded Cargo Volume

Unit: Thousand tons

		1993			1994			1995			1996			1997			1998	
	Unload	Load	Unload +	Unload	Load	Unload +	Unload	Load	Unload +	Unload	Load	Unload +	Unload	Load	Unload +	Unload	Load	Unload +
Province			Load			Load			Load			Load			Load			Load
Dista Aceh	1,205.5	2,688.2	3,893.7	1,234.1	2,906.2	4,140.3	952.7	2,865.6	3,818.3	1,144.5	3,432.4	4,576.9	1,249.0	3,215.0	4,464.0	940.9	2,233.5	3,174.4
Sumatra Utara	5,340.8	1,891.5	7,232.3	5,865.6	1,981.1	7,846.7	10,115.8	4,409.7	14,525.5	7,238.1	2,712.3	9,950.4	7,257.1	2,822.2	10,079.3	4,751.7	1,663.8	6,415.5
Sumatera Barat	1,155.8	1,231.1	2,386.9	1,444.7	2,344.7	3,789.4	1,837.8	2,497.7	4,335.5	2,070.3	3,262.2	5,332.5	2,054.2	3,187.4	5,241.6	1,815.3	2,870.7	4,686.0
Riau	13,073.5	18,338.4	31,411.9	16,106.8	25,188.4	41,295.2	25,184.3	43,334.0	68,518.3	24,716.0	44,912.5	69,628.5	23,064.1	43,965.1	67,029.2	15,967.5	29,274.5	45,242.0
Jambi	1,423.5	396.2	1,819.7	1,421.7	647.6	2,069.3	1,829.9	7,391.1	9,221.0	2,006.7	4,266.7	6,273.4	2,519.4	4,220.6	6,740.0	1,274.2	1,330.3	2,604.5
Sumatera Selatan	5,819.4	9,282.4	15,101.8	5,990.5	9,474.5	15,465.0	8,174.8	12,285.5	20,460.3	10,730.9	16,081.4	26,812.3	4,679.4	11,303.6	15,983.0	2,309.1	7,909.0	10,218.1
Bengkulu	179.7	68.2	247.9	218.8	131.0	349.8	266.2	77.4	343.6	389.5	205.4	594.9	446.9	168.7	615.6	283.2	88.9	372.1
Lampung	1,002.2	4,000.0	5,002.2	1,330.0	8,253.1	9,583.1	1,667.4	9,293.3	10,960.7	1,568.3	10,258.3	11,826.6	1,856.1	11,428.6	13,284.7	1,629.5	7,724.4	9,353.9
Sumatera TTL	29,200.4	37,896.0	67,096.4	33,612.2	50,926.6	84,538.8	50,028.9	82,154.3	132,183.2	49,864.3	85,131.2	134,995.5	43,126.2	80,311.2	123,437.4	28,971.4	53,095.1	82,066.5
DKI Jakarta	13,740.8	4,430.0	18,170.8	14,370.9	4,505.6	18,876.5	12,319.3	3,850.7	16,170.0	13,174.1	4,999.9	18,174.0	13,975.5	5,107.3	19,082.8	13,576.6	5,124.6	18,701.2
Jawa Barat	7,417.0	2,501.6	9,918.6	8,068.4	1,224.4	9,292.8	8,804.7	1,733.1	10,537.8	7,126.6	1,937.2	9,063.8	13,359.4	2,039.8	15,399.2	9,799.1	1,098.3	10,897.4
Jawa Tengah	17,022.3	9,256.7	26,279.0	15,936.1	8,120.8	24,056.9	12,448.9	7,730.4	20,179.3	11,725.8	8,245.1	19,970.9	16,806.0	8,404.8	25,210.8	8,769.0	5,073.4	13,842.4
DI Yogyakarta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jawa Timur	13,861.7	5,286.9	19,148.6	14,771.3	6,033.0	20,804.3	14,067.1	5,956.7	20,023.8	16,049.8	6,789.3	22,839.1	15,604.0	7,244.2	22,848.2	13,425.3	4,832.2	18,257.5
Jawa TTL	52,041.8	21,475.2	73,517.0	53,146.7	19,883.8	73,030.5	47,640.0	19,270.9	66,910.9	48,076.3	21,971.5	70,047.8	59,744.9	22,796.1	82,541.0	45,570.0	16,128.5	61,698.5
Bali	2,013.2	2,571.6	4,584.8	1,790.7	200.9	1,991.6	1,198.1	58.5	1,256.6	1,172.3	38.1	1,210.4	1,355.4	52.3	1,407.7	892.3	43.4	935.7
Nusa Tenggara Barat	1,037.4	564.6	1,602.0	693.5	473.4	1,166.9	939.0	319.1	1,258.1	863.5	1,135.4	1,998.9	893.3	1,096.0	1,989.3	2,553.4	203.4	2,756.8
Nusa Tenggara Timur	646.9	393.7	1,040.6	769.1	480.9	1,250.0	1,064.2	642.2	1,706.4	1,047.1	663.8	1,710.9	1,162.8	583.1	1,745.9	786.3	570.1	1,356.4
Timor Timur	223.3	10.7	234.0	174.7	6.2	180.9	695.1	28.2	723.3	256.2	11.2	267.4	181.2	19.1	200.3	190.5	14.1	204.6
Nusa Tenggara TTL	3,920.8	3,540.6	7,461.4	3,428.0	1,161.4	4,589.4	3,896.4	1,048.0	4,944.4	3,339.1	1,848.5	5,187.6	3,592.7	1,750.5	5,343.2	4,422.5	831.0	5,253.5
Karimantan Barat	1,807.0	853.4	2,660.4	1,850.5	1,012.8	2,863.3	1,598.2	672.0	2,270.2	1,843.3	938.9	2,782.2	1,842.1	1,014.9	2,857.0	1,334.1	424.7	1,758.8
Karimantan Tengah	752.4	2,430.4	3,182.8	561.8	2,956.3	3,518.1	778.5	2,047.7	2,826.2	702.5	2,275.7	2,978.2	874.9	1,343.3	2,218.2	465.5	1,178.1	1,643.6
Karimantan Selatan	1,733.6	1,450.8	3,184.4	4,122.1	3,572.5	7,694.6	4,206.7	2,053.5	6,260.2	7,980.0	2,968.9	10,948.9	9,001.2	5,063.5	14,064.7	12,650.4	11,230.2	23,880.6
Karimantan Timur	15,016.6	20,244.8	35,261.4	16,307.6	24,071.1	40,378.7	16,109.0	62,125.9	78,234.9	23,882.1	38,329.3	62,211.4	16,477.2	25,681.0	42,158.2	14,512.5	23,067.5	37,580.0
Karimantan TTL	19,309.6	24,979.4	44,289.0	22,842.0	31,612.7	54,454.7	22,692.4	66,899.1	89,591.5	34,407.9	44,512.8	78,920.7	28,195.4	33,102.7	61,298.1	28,962.5	35,900.5	64,863.0
Sulawesi Utara	947.2	544.5	1,491.7	1,499.3	794.0	2,293.3	1,325.8	710.7	2,036.5	1,963.5	1,204.0	3,167.5	1,706.2	1,195.9	2,902.1	1,450.5	1,060.7	2,511.2
Sulawesi Tengah	505.4	1,288.3	1,793.7	567.6	1,056.4	1,624.0	820.4	2,244.0	3,064.4	896.6	2,269.0	3,165.6	797.6	2,134.7	2,932.3	1,379.4	935.5	2,314.9
Sulawesi Selatan	2,526.7	2,470.1	4,996.8	3,237.4	3,120.4	6,357.8	3,866.2	2,884.5	6,750.7	3,341.8	2,760.7	6,102.5	3,591.4	2,714.7	6,306.1	2,491.1	2,085.4	4,576.5
Sulawesi Tenggara	829.0	257.5	1,086.5	821.8	270.9	1,092.7	1,008.8	550.1	1,558.9	1,612.3	521.5	2,133.8	1,410.9	477.9	1,888.8	2,667.1	1,390.5	4,057.6
Sulawesi TTL	4,808.3	4,560.4	9,368.7	6,126.1	5,241.7	11,367.8	7,021.2	6,389.3	13,410.5	7,814.2	6,755.2	14,569.4	7,506.1	6,523.2	14,029.3	7,988.1	5,472.1	13,460.2
Maluku	1,089.0	567.9	1,656.9	1,739.2	816.1	2,555.3	3,090.6	1,578.6	4,669.2	1,986.3	788.3	2,774.6	2,538.1	927.7	3,465.8	2,293.9	1,728.3	4,022.2
Irian Jaya	2,092.0	980.4	3,072.4	2,438.3	1,488.4	3,926.7	1,698.1	1,213.4	2,911.5	3,018.3	3,204.9	6,223.2	3,351.6	2,358.1	5,709.7	1,587.0	331.6	1,918.6
Maluku dan																		
Irian Jaya TTL	3,181.0	1,548.3	4,729.3	4,177.5	2,304.5	6,482.0	4,788.7	2,792.0	7,580.7	5,004.6	3,993.2	8,997.8	5,889.7	3,285.8	9,175.5	3,880.9	2,059.9	5,940.8
Adjustment	0.1	0.1	0.2	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.1	-0.1
Indonesia TTL	112,462.0	94,000.0	206,462.0	123,332.4	111,130.8	234,463.2	136,067.6	178,553.6	314,621.2	148,506.4	164,212.4	312,718.8	148,055.0	147,769.5	295,824.5	119,795.2	113,487.2	233,282.4

Source: Statistik Indonesia 1993,1994,1995,1996,1997,1998

	Units: GDP; Billion Rupiahs, Cargo Volume; Thousand ton													
Year	GDP1993 Constant	Interisland Cargo Volume	Log GDP	Log Cargo	Cargo Volume									
1989	253,478.4	64,661.6	5.404	4.811	64,661.6									
1990	271,728.9	78,671.1	5.434	4.896	78,671.1									
1991	290,749.9	85,088.9	5.464	4.930	85,088.9									
1992	309,648.6	99,385.4	5.491	4.997	99,385.4									
1993	329,775.8	103,231.0	5.518	5.014	103,231.0									
1994	354,640.8	117,231.6	5.550	5.069	117,231.6									
1995	383,792.3	157,310.6	5.584	5.197	157,310.6									
1996	413,797.9	156,359.4	5.617	5.194	156,359.4									
1997	433,245.9	147,912.3	5.637	5.170	147,912.3									
1998	376,374.9	116,641.2	5.576	5.067	116,641.2									
2007	603,544	-	5.781	5.443	277,279									
2020	1,368,526	-	6.136	5.903	800,721									

Table 8.2.2. Interisland Cargo Volume

8.2.3. International Cargo Volume

The International cargo volume between 1993-1998 is shown in **Table 8.2.3**. By the regression analysis of correlation between GDP and cargo volume as shown in **Table 8.2.4**., the **formula 8.2.3**. is obtained.

Y = 1.0722 × - 0.6976 (formula 8.2.3.)

 $R^2 = 0.7826$

Where,

X : Log(GDP)

Y : Log (Cargo)

The elasticity resulted to be 1.0722. Considering that Indonesia is a developing country, this can be regarded as a reasonable figure.

The future total sea-borne cargo volume is predicted from the calculation of the approximate expression of the **formula 8.2.3**. based on the past data.

	1993			1994		1995			1996			1997		1998				
	Unload	Load		Unload	Load		Unload	Load		Unload	Load		Unload	Load		Unload	Load	
Province	(a)	(b)	(a) + (b)	(a)	(b)	(a) + (b)	(a)	(b)	(a) + (b)	(a)	(b)	(a) + (b)	(a)	(b)	(a) + (b)	(a)	(b)	(a) + (b)
Dista Aceh	46.7	34.300.0	34.346.7	78.5	34.536.7	34.615.2	220.5	33.630.3	33.850.8	261.3	29.647.9	29.909.2	158.9	29.379.3	29.538.2	321.2	26.661.2	26.982.4
Sumatra Utara	1.865.8	3.935.8	5.801.6	2.033.2	3.966.1	5.999.3	2.321.4	2.611.7	4.933.1	4.268.6	3.828.4	8.097.0	2.848.3	4.700.2	7.548.5	1.384.4	2.994.2	4.378.6
Sumatera Barat	87.1	1.643.3	1.730.4	268.0	1.843.3	2.111.3	424.2	2.543.2	2.967.4	261.9	2.333.6	2.595.5	398.7	2.388.4	2.787.1	394.8	2.905.0	3.299.8
Riau	1.042.1	33.600.3	34.642.4	1.488.9	42.819.0	44.307.9	3.085.0	28.236.5	31.321.5	2.113.3	25.700.1	27.813.4	2.843.2	26.127.2	28.970.4	2.181.3	24.514.4	26.695.7
Jambi	292.8	587.6	880.4	221.6	900.8	1.122.4	198.0	661.7	859.7	253.0	899.5	1.152.5	177.6	908.9	1.086.5	80.1	759.0	839.1
Sumatera Selatan	1.806.4	3.028.7	4.835.1	1.833.8	3.087.4	4.921.2	2.051.5	3.190.4	5.241.9	2.220.0	3.522.1	5.742.1	249.6	2.183.2	2.432.8	201.6	2.172.1	2.373.7
Bengkulu	33.2	270.4	303.6	19.6	438.2	457.8	16.0	1.100.9	1.116.9	20.5	626.6	647.1	5.5	685.2	690.7	114.7	1.002.5	1.117.2
Lampung	4.988.7	964.6	5.953.3	7.641.9	1.204.4	8.846.3	778.0	1.739.2	2.517.2	860.0	1.570.6	2.430.6	964.7	1.897.4	2.862.1	700.2	1.967.8	2.668.0
Sumatera TTL	10.162.8	78.330.7	88.493.5	13.585.5	88.795.9	102.381.4	9.094.6	73.713.9	82.808.5	10.258.6	68.128.8	78.387.4	7.646.5	68.269.8	75.916.3	5.378.3	62.976.2	68.354.5
DKI Jakarta	12.244.1	6.153.4	18.397.5	14.770.5	5.640.3	20.410.8	17.204.8	6.455.8	23.660.6	25.591.9	7.412.9	33.004.8	19.267.7	6.742.3	26.010.0	11.837.7	10.134.1	21.971.8
Jawa Barat	5.522.5	1.886.7	7.409.2	5.354.8	682.7	6.037.5	6.901.3	696.4	7.597.7	6.291.4	706.6	6.998.0	7.945.6	695.8	8.641.4	4.956.7	1.565.5	6.522.2
Jawa Tengah	1.964.1	1.663.7	3.627.8	2.388.2	1.957.6	4.345.8	5.791.0	1.931.4	7.722.4	6.640.9	2.092.2	8.733.1	6.631.9	1.932.4	8.564.3	3.017.7	1.370.2	4.387.9
DI Yogyakarta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jawa Timur	5.925.5	2.446.9	8.372.4	8.720.9	3.381.1	12.102.0	7.284.2	3.847.7	11.131.9	10.271.9	5.083.0	15.354.9	8.919.5	6.730.1	15.649.6	8.849.3	8.504.6	17.353.9
Jawa TTL	25.656.2	12.150.7	37.806.9	31.234.4	11.661.7	42.896.1	37.181.3	12.931.3	50.112.6	48.796.1	15.294.7	64.090.8	42.764.7	16.100.6	58.865.3	28.661.4	21.574.4	50.235.8
Bali	5.2	2.3	7.5	3.7	0.4	4.1	1.1	1.2	2.3	33.8	0.6	34.4	40.6	0.3	40.9	50.3	0.9	51.2
Nusa Tenggara Barat	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	3.7	1.5	0.0	1.5	1.1	0.0	1.1	95.7	0.0	95.7
Nusa Tenggara Timur	0.0	7.6	7.6	50.4	6.7	57.1	34.0	1.2	35.2	52.7	0.0	52.7	41.3	3.9	45.2	91.7	16.7	108.4
Timor Timur	9.3	0.1	9.4	0.1	1.1	1.2	23.7	0.0	23.7	36.7	0.0	36.7	100.7	3.1	103.8	97.7	3.0	100.7
Nusa Tenggara TTL	14.5	10.0	24.5	54.2	8.2	62.4	62.5	2.4	64.9	124.7	0.6	125.3	183.7	7.3	191.0	335.4	20.6	356.0
Karimantan Barat	139.1	1.175.4	1.314.5	129.6	1.182.5	1.312.1	103.5	864.5	968.0	51.4	891.5	942.9	64.2	755.9	820.1	68.6	725.1	793.7
Karimantan Tengah	0.6	302.0	302.6	32.8	309.0	341.8	0.1	383.7	383.8	1.3	348.3	349.6	2.9	465.6	468.5	1.0	258.4	259.4
Karimantan Selatan	486.8	5.125.0	5.611.8	97.5	7.612.2	7.709.7	388.6	13.368.8	13.757.4	293.5	16.187.2	16.480.7	567.0	18.965.7	19.532.7	117.2	19.726.6	19.843.8
Karimantan Timur	4.046.7	39.080.6	43.127.3	2.201.5	41.224.9	43.426.4	20.471.9	28.767.2	49.239.1	12.084.4	32.217.7	44.302.1	1.742.1	25.299.4	27.041.5	8.357.5	25.898.3	34.255.8
Karimantan TTL	4.673.2	45.683.0	50.356.2	2.461.4	50.328.6	52.790.0	20.964.1	43.384.2	64.348.3	12.430.6	49.644.7	62.075.3	2.376.2	45.486.6	47.862.8	8.544.3	46.608.4	55.152.7
Sulawesi Utara	21.8	225.6	247.4	24.8	305.6	330.4	190.8	244.5	435.3	282.4	390.6	673.0	174.3	575.4	749.7	138.2	399.8	538.0
Sulawesi Tengah	0.0	0.0	0.0	15.7	26.0	41.7	139.9	41.1	181.0	134.9	48.1	183.0	77.6	44.4	122.0	0.0	62.4	62.4
Sulawesi Selatan	830.9	630.0	1.460.9	848.5	695.8	1.544.3	4.938.4	450.9	5.389.3	3.557.4	374.0	3.931.4	3.370.1	464.0	3.834.1	4.003.5	699.5	4.703.0
Sulawesi Tenggara	2.6	295.8	298.4	18.5	341.5	360.0	116.3	12.1	128.4	7.5	9.2	16.7	96.0	4.6	100.6	0.0	443.0	443.0
Sulawesi TTL	855.3	1.151.4	2.006.7	907.5	1.368.9	2.276.4	5.385.4	748.6	6.134.0	3.982.2	821.9	4.804.1	3.718.0	1.088.4	4.806.4	4.141.7	1.604.7	5.746.4
Maluku	338.4	1.905.6	2.244.0	335.1	2.071.6	2.406.7	94.8	83.9	178.7	230.3	66.3	296.6	382.0	78.0	460.0	19.0	701.5	720.5
Irian Jaya	272.3	1.629.8	1.902.1	279.0	1.634.2	1.913.2	20.7	827.8	848.5	263.1	1.043.8	1.306.9	124.7	258.3	383.0	59.2	213.9	273.1
Maluku dan			0.0															0.0
Irian Jaya TTL	610.7	3.535.4	4.146.1	614.1	3.705.8	4.319.9	115.5	911.7	1.027.2	493.4	1.110.1	1.603.5	506.7	336.3	843.0	78.2	915.4	993.6
Adjustment	0.0	-0.2	-0.2	-0.1	0.2	0.1	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	-0.2	0.4	0.2
indonesia 11L	A1 972 7	140 861 0	182 833 7	48 857 0	155 869 3	204 726 3	72 803 4	1316921	204 495 5	76 085 6	135 000 8	211 086 4	57 195 8	131 289 0	188 484 8	47 139 1	133 700 1	180 839 2

Table 8.2.3. International Unloaded and Loaded Cargo Volume

Unit: Thousand tons

Source: Statistik Indonesia 1993,1994,1995,1996,1997,1998

	emesi		upians, earge	, ()	usuna ten
Year	GDP1993 Constant	Interisland Cargo Volume	Log GDP	Log Cargo	Cargo Volume
1989	253,478.4	105,644.5	5.404	5.024	105,644.5
1990	271,728.9	135,595.5	5.434	5.123	135,595.5
1991	290,749.9	148,283.5	5.464	5.171	148,283.5
1992	309,648.6	166,748.4	5.491	5.222	166,748.4
1993	329,775.8	182,833.7	5.518	5.262	182,833.7
1994	354,640.8	204,726.3	5.550	5.311	204,726.3
1995	383,792.3	204,495.5	5.584	5.311	204,495.5
1996	413,797.9	211,086.4	5.617	5.324	211,086.4
1997	433,245.9	188,484.8	5.637	5.275	188,484.8
1998	376,374.9	180,839.2	5.576	5.257	180,839.2
2007	603,544		5.781	5.500	316,575
2020	1,368,526		6.136	5.882	761,536

 Table 8.2.4. International Cargo Volume

 Units: GDP: Billion Rupiahs. Cargo Volume: Thousand ton

8.2.4 The Number of Vessels Analysis by Formula

(1) Present vessel volume

Number of vessels calling Indonesian ports and their total gross tonnage (GT) are shown in **Table 8.2.5.**, which show 25 strategic ports in Indonesia and all Indonesian ports respectively.

		Q ²	1	995	1	996	1	997	1	998
Province		Port	Unit	GT	Unit	GT	Unit	GT	Unit	GT
D.I. Aceh	1	Lhokemawe	1,085	28,710,326	1,511	27,841,023	1,185	25,869,885	105	24,978,847
Sumatera Utara	2	Belawan	5,075	19,928,382	5,203	21,054,395	4,525	20,237,463	6,320	23,824,337
Sumatera Barat	3	Teluk Bayur	1,862	7,641,407	2,881	6,511,462	2,762	8,114,709	1,431	8,082,611
Riau	4	Batam	226	20,571	3,965	335,330	40,355	2,015,992	215,116	18,272,814
	5	Tanjung Pinang	26,140	5,601,958	24,123	3,504,587	24,692	6,398,126	29,812	7,136,095
	6	Dumai	5,354	40,609,593	5,735	41,660,014	4,997	37,618,555	6,855	36,867,860
	7	Pekanbaru	6,093	12,478,791	6,682	23,641,982	6,325	12,137,799	7,029	13,467,751
Sumatera Selatan	8	Palembang	5,222	12,728,787	7,146	17,471,389	4,469	10,930,324	4,194	9,871,390
Lampung	9	Panjang	2,540	18,784,337	2,657	23,470,194	2,826	27,969,071	2,332	22,680,155
DKI Jakarta	10	Tanjung Priok	15,788	70,458,697	15,276	71,686,857	16,378	77,924,476	14,488	74,447,705
Jawa Barat	11	Cigading	3,459	14,835,547	3,127	15,748,765	3,157	19,799,396	2,967	16,256,352
Jawa Tengah	12	Tanjung Emas	4,630	10,062,457	4,452	11,552,382	4,235	12,429,372	4,791	19,660,987
Jawa Timur	13	Tanjung Perak	11,363	28,890,430	18,073	64,155,977	14,316	57,006,713	11,118	33,445,065
Bali	14	Benoa	9,284	3,680,187	7,903	4,403,061	7,949	4,664,924	7,451	3,799,395
Nusa Tengara Timur	15	Tenau(Kupang)	1,660	1,622,983	1,680	2,587,548	1,932	2,832,506	1,474	2,138,212
Kalimantan Barat	16	Pontianak	3,259	5,443,804	7,680	41,902,397	4,264	8,089,959	3,916	8,190,462
Kalimantan Seletan	17	Banjarmasin	6,192	9,525,474	7,208	17,735,620	7,486	20,452,070	5,508	14,535,258
Kalimantan Timur	18	Samarinda	10,377	13,472,853	11,220	12,609,189	14,152	25,852,606	13,636	17,684,016
	19	Balikpapan	7,744	27,681,810	6,455	16,908,666	7,201	37,893,394	5,584	85,717,311
Sulawesi Utara	20	Bitung	3,151	5,301,811	3,771	5,322,523	3,569	5,676,687	10,432	10,281,889
Sulawesi Seletan	21	Makassar	10,449	25,505,180	5,881	23,557,502	5,322	14,434,304	18,319	87,068,750
Maluku	22	Ambon	3,538	4,357,632	3,020	5,038,462	3,457	4,764,126	21,164	32,839,275
Irian Jaya	23	Jayapura	839	1,397,129	1,737	2,650,879	912	1,515,996	825	1,615,605
82	24	Biak	1,401	3,038,804	1,121	2,299,311	1,200	2,445,874	1,168	2,369,726
	25	Sorong	3,894	4,184,577	2,519	3,317,502	2,838	3,290,651	3,163	3,626,895
TTL 25 Strategic Port			150,625	375,963,527	161,026	466,967,017	190,504	450,364,978	399,198	578,858,763
G. TTL	1		391,954	535,997,840	542,086	674,140,940	505,759	644,999,330	606,525	792,623,983

Table 8.2.5. Number of Vessels and Total Gross Tonnage of Calling Vessels in 25 Strategic Ports

Source : Statistic Perhubungan 1995,1996,1997,1998

Number of vessels calling in Indonesian ports of interisland voyage and international voyage are shown in **Table 8.2.6**.

Average GT per vessel in domestic voyage is 698 GT in 1997, 1022GT in 1998 and in foreign voyage is 4,800 GT in 1997, 2,147 GT in 1998.

		Units	GT	GT/Unit
Interisland	1997	436,733	304,657,391	698
	1998	453,528	463,527,853	1,022
International	1997	69,026	331,341,939	4,800
	1998	153,267	329,096,130	2,147
Interisland	1997	505,759	635,999,330	1,258
+ International	1998	606,795	792,623,983	1,306

Table 8.2.6. Number of Vessels and Total Gross Tonnage inInterisland and International Voyage

Source: Statistik Perhubungan 1997,1998

Numbers of major vessels calling in Indonesian ports by the survey of DGSC are shown in **Table 8.2.7**. DGSC collected these data from foreign and Indonesian shipping company.

Total numbers of vessels are 5339 vessels, total calls are 19,775 calls and average DWT is 21,890 ton.

Export												
		Forei	gn Vessels]	Indones	ian Vessels	8]	Foreign	+ Indonesian	l
Vessel type	Number	Call	TTL DWT	Average	Number	Call	TTL DWT	Average	Number	Call	TTL DWT	Average
	of Vessel			DWT	of Vessel			DWT	of Vessel			DWT
Bulk Carrier	629	1,227	56,654,970	46,174	2	3	2,752	917	631	1,230	56,657,722	46,063
G. C. Carrier	1,122	6,074	99,916,709	16,450	127	632	253,197	401	1,249	6,706	100,169,906	14,937
Reefer	30	115	276,244	2,402	0	0	0	0	30	115	276,244	2,402
Container	288	1,403	21,124,812	15,057	9	35	53,193	1,520	297	1,438	21,178,005	14,727
Tanker	949	2,990	128,154,443	42,861	10	19	533,993	28,105	959	3,009	128,688,436	42,768
Total	3,018	11,809	306,127,178	25,923	148	689	843,135	1,224	3,166	12,498	306,970,313	24,562
Import												
		Forei	gn Vessels]	[ndones	ian Vessels	8]	Foreign	+ Indonesian	l
Vessel type	Number	Call	TTL	Average	Number	Call	TTL	Average	Number	Call	TTL	Average
	of Vessel DWT DWT		DWT	of Vessel		DWT	DWT	of Vessel		DWT	DWT	
Bulk Carrier	79 147 6,701,927 45,59		45,591	1	1	310	310	80	148	6,702,237	45,285	
G. C. Carrier	1,095	3,344	59,246,114	17,717	90	364	2,223,125	6,107	1,185	3,708	61,469,239	16,577
Reefer	7	26	58,693	2,257	0	0	0	0	7	26	58,693	2,257
Container	277	1,441	21,151,153	14,678	8	51	75,282	1,476	285	1,492	21,226,435	14,227
Tanker	611	1,892	36,372,809	19,225	5	11	75,427	6,857	616	1,903	36,448,236	19,153
Total	2,069	6,850	123,530,696	18,034	104	427	2,374,144	5,560	2,173	7,277	125,904,840	17,302
Export + Imp	oort				-							
		Forei	gn Vessels]	[ndones	ian Vessels	5]	Foreign	+ Indonesian	l
Vessel type	Number	Call	TTL	Average	Number	Call	TTL	Average	Number	Call	TTL	Average
	of Vessel		DWT	DWT	of Vessel		DWT	DWT	of Vessel		DWT	DWT
Bulk Carrier	708	1,374	63,356,897	46,111	3	4	3,062	766	711	1,378	63,359,959	45,980
G. C. Carrier	2,217	9,418	159,162,823	16,900	217	996	2,476,322	2,486	2,434	10,414	161,639,145	15,521
Reefer	37	141	334,937	2,375	0	0	0	0	37	141	334,937	2,375
Container	565	2,844	42,275,965	14,865	17	86	128,475	1,494	582	2,930	42,404,440	14,473
Tanker	1,560	4,882	164,527,252	33,701	15	30	609,420	20,314	1,575	4,912	165,136,672	33,619
Total	5,087	18,659	429,657,874	23,027	252	1,116	3,217,279	2,883	5,339	19,775	432,875,153	21,890

Table 8.2.7. Numbers of Major Vessels Calling in Indonesian Ports

Source: 1999, DGSC based on data from shipping companies.

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(2) Forecast of vessel volume

The future interisland calling vessel volume and international calling vessel volume are shown in **Table 8.2.9**.

The change of average size and annual growth rate are shown in Table 8.2.8.

	Total Vessels	GT	GT/Vsl	Rate
1988	75,680	403,406,000	5,330.4	1.000
1989	76,100	410,481,000	5,394.0	1.012
1990	78,336	423,627,000	5,407.8	1.003
1991	80,030	436,027,000	5,448.3	1.007
1992	79,845	444,305,000	5,564.6	1.021
1993	80,655	457,915,000	5,677.5	1.020
1994	80,676	475,859,000	5,898.4	1.039
1995	82,890	490,662,000	5,919.4	1.004
1996	84,264	507,873,000	6,027.2	1.018
1997	85,494	522,197,000	6,108.0	1.013
1998	85,828	531,893,000	6,197.2	1.015
		1988 - 199	8 Average	1.015

Table 8.2.8. Changes of Average Size

Table 8.2.9.	Future	Interisland	and Inte	rnational	Calling	Vessels	Volume
							Unit: calls

	Lik	eliest Ca	ase	Opti	imistic C	ase	Pess	imistic (Case
		Inter-			Inter-			Inter-	
	Interisland	National	Total	Interisland	national	Total	Interisland	national	Total
1999	440,373	98,466	538,839	440,373	98,466	538,839	440,372	98,466	538,839
2007	826,153	143,726	969,879	968,027	159,690	1,127,717	703,483	129,16	832,646
2020	1,965,919	284,899	2,250,81	2,915,290	384,679	3,299,969	1,318,318	210,10	1,528,420

8.2.5. Route-wise Domestic Vessel

To forecast domestic route-wise vessel volume, gravity model methods should be applied. The model is expressed by the **formula 8.2.4. formula 8.2.5.** and **formula 8.2.6**.

$$X_{ij} = k G_i^{a} G_j^{b} f(T_{ij})$$
 (formula 8.2.4)

$$V_{j} = k \sum_{j=1}^{n} X_{ij} = k \sum_{j=1}^{n} G_{i}^{a} G_{j}^{b} / T^{r} ij \qquad (for mula \ 8.2.5)$$

$$V = \sum_{i=1}^{m} \sum_{i=1}^{n} X_{ij} = k \sum_{i=1}^{m} \sum_{i=1}^{n} G^{a} G_{j}^{b} / T^{r} ij \qquad (formula \ 8.2.6)$$

Where

e	
k, a , b	: Coefficients
$G_{_i}$: GRDP at Province i
G_{j}	: GRDP at Province j
$f(T_{ij}) =$	$= T_{ij}^{-r}$: Traffic Resistance from i to j
V_{j}	: Total vessel volume in Destination j
V	: Grand total vessel volume

In the above formula, it is supposed that and are to be 1.0, while shall range between 0 to 2.0. is to be 1.0 as most adaptable value. By the regression analysis of the correlation between GDP and calling ship volume by ports, the following model is obtained.

$$V_{i j} = 0.000239 \text{GiGj} / \text{R}$$
 (for mula 8.2.7)

Where

V_{i j} : Total vessel volume from origin *i* to destination *j*R : Distance from origin *i* to destination *j*

Results of the calculations are shown in **Table 8.2.10**, **Table 8.2.11**, **Table 8.2.12**, and summarized in **Figure 8.2.1**, **Figure 8.2.2**, **Figure 8.2.3**, whose are forecasted in 2001, 2007, 2020 of likeliest case respectively.

OD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Fotal
1 D.I. Ache	0	650	12	2,515	37	52	4	26	41	35	36	146	29	5	38	2	42	14	40	141	41	23	90	47	165	22	4,253
2 Sumatera Utara	650	0	69	18,925	259	316	21	150	248	203	223	874	165	30	210	12	255	81	229	874	227	127	522	264	911	121	25,964
3 Sumatera Barat	12	69	0	972	31	57	22	63	83	85	44	224	46	7	53	3	43	19	56	188	54	30	122	62	215	29	2,589
4 Riau	2,515	18,925	972	0	5,150	5,181	329	2,285	3,746	3,088	3,680	12,356	2,353	434	2,897	165	4,162	1,155	3,367	11,104	3,093	1,850	7,212	3,819	12,441	1,636	113,914
5 Jambi	37	259	31	5,150	0	336	10	89	146	132	77	383	68	11	79	4	146	31	107	344	88	51	217	102	335	43	8,274
6 Sumatera Selatan	52	316	57	5,181	336	0	19	190	293	256	161	783	131	22	147	8	266	55	206	613	168	91	405	184	607	78	10,623
7 Bengkuru	4	21	22	329	10	19	0	27	32	36	15	70	14	2	15	1	13	5	17	57	15	9	48	18	59	8	864
8 Lampung	26	150	63	2,285	89	190	27	0	696	1,081	150	617	96	17	103	5	124	39	142	417	107	65	278	130	410	52	7,358
9 DKI Jakarta	41	248	83	3,746	146	293	32	696	0	1,213	317	1,207	177	28	173	9	192	63	267	771	165	108	467	219	686	85	11,431
10 Jawa Barat	35	203	85	3,088	132	256	36	1,081	1,213	0	212	898	138	23	145	8	178	54	215	599	140	91	376	181	574	73	10,033
11 Jawa Tengah	36	223	44	3,680	77	161	15	150	317	212	0	1,668	176	27	154	8	143	55	295	663	148	100	479	198	579	71	9,679
12 Jawa Timur	146	874	224	12,356	383	783	70	617	1,207	898	1,668	0	1,603	284	1,223	59	738	396	2,303	5,558	941	733	3,656	1,608	4,323	507	43,158
13 Bali	29	165	46	2,353	68	131	14	96	177	138	176	1,603	0	103	398	17	120	90	360	1,104	228	175	1,185	428	1,119	125	10,446
14 Nusa Tengara Barat	5	30	7	434	11	22	2	17	28	23	27	284	103	0	79	4	21	17	62	224	50	34	264	104	224	24	2,100
15 Nusa Tenggara Timur	38	210	53	2,897	79	147	15	103	173	145	154	1,223	398	79	0	118	138	116	315	1,277	553	212	1,304	911	3,174	283	14,115
16 Timor Timur	2	12	3	165	4	8	1	5	9	8	8	59	17	4	118	0	7	7	16	76	34	23	78	52	241	19	974
17 Kalimantan Barat	42	255	43	4,162	146	266	13	124	192	178	143	738	120	21	138	7	0	52	162	603	132	90	355	177	571	72	8,802
18 Kalimantan Tengah	14	81	19	1,155	31	55	5	39	63	54	55	396	90	17	116	7	52	0	130	1,237	294	249	452	178	674	93	5,556
19 Kalimantan Seletan	40	229	56	3,367	107	206	17	142	267	215	295	2,303	360	62	315	16	162	130	0	1,724	296	266	1,308	466	1,216	141	13,708
20 Kalimantan Timur	141	874	188	11,104	344	613	57	417	771	599	663	5,558	1,104	224	1,277	76	603	1,237	1,724	0	2,502	3,693	6,919	2,138	5,383	638	48,847
21 Sulawesi Utara	41	227	54	3,093	88	168	15	107	165	140	148	941	228	50	553	34	132	294	296	2,502	0	449	1,210	694	5,303	671	17,601
22 Sulawesi Tengah	23	127	30	1,850	51	91	9	65	108	91	100	733	175	34	212	23	90	249	266	3,693	449	0	1,092	359	981	137	11,036
23 Sulawesi Selatan	90	522	122	7,212	217	405	48	278	467	376	479	3,656	1,185	264	1,304	78	355	452	1,308	6,919	1,210	1,092	0	3,349	5,259	543	37,189
24 Sulawesi Tenggara	47	264	62	3,819	102	184	18	130	219	181	198	1,608	428	104	911	52	177	178	466	2,138	694	359	3,349	0	3,230	336	19,254
25 Maluku	165	911	215	12,441	335	607	59	410	686	574	579	4,323	1,119	224	3,174	241	571	674	1,216	5,383	5,303	981	5,259	3,230	0	3,159	51,838
26 Irian Jaya	22	121	29	1,636	43	78	8	52	85	73	71	507	125	24	283	19	72	93	141	638	671	137	543	336	3,159	0	8,966
Total	4,253	25,964	2,589	113,914	8,274	10,623	864	7,358	11,431	10,033	9,679	43,158	10,446	2,100	14,115	974	8,802	5,556	13,708	48,847	17,601	11,036	37,189	19,254	51,838	8,966	498,572

Table 8.2.10. Route-wise Domestic Vessels (Likeliest Case, 2001)

OD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total
1 D.I. Ache	0	1,076	20	4,167	61	85	6	43	68	59	60	242	48	9	63	3	69	24	66	234	68	37	150	78	273	37	7,047
2 Sumatera Utara	1,076	0	114	31,360	429	523	36	249	410	336	370	1,449	273	49	348	19	423	134	380	1,448	376	210	864	437	1,509	200	43,023
3 Sumatera Barat	20	114	0	1,610	51	94	37	104	138	141	72	371	77	12	88	4	72	32	93	312	89	50	203	103	357	48	4,290
4 Riau	4,167	31,360	1,610	0	8,534	8,585	545	3,786	6,207	5,117	6,098	20,475	3,898	720	4,801	273	6,896	1,915	5,578	18,400	5,125	3,065	11,951	6,328	20,616	2,711	188,760
5 Jambi	61	429	51	8,534	0	557	16	147	242	219	127	634	112	19	131	7	243	51	177	570	147	84	359	169	555	71	13,710
6 Sumatera Selatan	85	523	94	8,585	557	0	32	314	485	425	266	1,297	218	36	244	13	441	91	341	1,016	278	151	671	306	1,005	129	17,602
7 Bengkuru	6	36	37	545	16	32	0	44	53	60	24	116	23	3	24	1	22	9	28	94	25	14	80	29	97	13	1,432
8 Lampung	43	249	104	3,786	147	314	44	0	1,153	1,792	249	1,023	160	27	171	9	205	64	235	691	177	108	461	215	679	86	12,193
9 DKI Jakarta	68	410	138	6,207	242	485	53	1,153	0	2,010	525	2,001	293	46	286	15	318	105	443	1,278	273	179	774	363	1,137	140	18,942
10 Jawa Barat	59	336	141	5,117	219	425	60	1,792	2,010	0	352	1,487	229	37	241	13	296	89	356	993	232	150	623	299	952	121	16,626
11 Jawa Tengah	60	370	72	6,098	127	266	24	249	525	352	0	2,763	291	45	256	13	236	92	488	1,099	245	166	794	329	959	118	16,039
12 Jawa Timur	242	1,449	371	20,475	634	1,297	116	1,023	2,001	1,487	2,763	. 0	2,656	471	2,027	98	1,223	657	3,816	9,210	1,559	1,214	6,059	2,664	7,164	841	71,514
13 Bali	48	273	77	3,898	112	218	23	160	293	229	291	2,656	0	170	659	28	199	149	597	1,830	377	290	1,964	709	1,854	207	17,309
14 Nusa Tengara Barat	9	49	12	720	19	36	3	27	46	37	45	471	170	0	130	6	35	29	103	371	83	56	437	172	371	41	3,480
15 Nusa Tenggara Timur	63	348	88	4,801	131	244	24	171	286	241	256	2,027	659	130	0	196	229	193	522	2,116	916	351	2,160	1,509	5,260	469	23,390
16 Timor Timur	3	19	4	273	7	13	1	9	15	13	13	98	28	6	196	0	12	11	27	127	56	39	129	86	399	31	1,614
17 Kalimantan Barat	69	423	72	6,896	243	441	22	205	318	296	236	1,223	199	35	229	12	0	86	269	999	219	149	588	293	946	120	14,586
18 Kalimantan Tengah	24	134	32	1,915	51	91	9	64	105	89	92	657	149	29	193	11	86	0	215	2,049	487	413	748	295	1,116	155	9,207
19 Kalimantan Seletan	66	380	93	5,578	177	341	28	235	443	356	488	3,816	597	103	522	27	269	215	0	2,857	490	442	2,168	773	2,016	234	22,715
20 Kalimantan Timur	234	1,448	312	18,400	570	1,016	94	691	1,278	993	1,099	9,210	1,830	371	2,116	127	999	2,049	2,857	0	4,146	6,119	11,465	3,542	8,919	1,057	80,941
21 Sulawesi Utara	68	376	89	5,125	147	278	25	177	273	232	245	1,559	377	83	916	56	219	487	490	4,146	0	744	2,005	1,150	8,787	1,112	29,165
22 Sulawesi Tengah	37	210	50	3,065	84	151	14	108	179	150	166	1,214	290	56	351	39	149	413	442	6,119	744	0	1,809	595	1,626	226	18,287
23 Sulawesi Selatan	150	864	203	11,951	359	671	80	461	774	623	794	6,059	1,964	437	2,160	129	588	748	2,168	11,465	2,005	1,809	0	5,550	8,714	900	61,624
24 Sulawesi Tenggara	78	437	103	6,328	169	306	29	215	363	299	329	2,664	709	172	1,509	86	293	295	773	3,542	1,150	595	5,550	0	5,353	556	31,905
25 Maluku	273	1,509	357	20,616	555	1,005	97	679	1,137	952	959	7,164	1,854	371	5,260	399	946	1,116	2,016	8,919	8,787	1,626	8,714	5,353	0	5,235	85,898
26 Irian Jaya	37	200	48	2,711	71	129	13	86	140	121	118	841	207	41	469	31	120	155	234	1,057	1,112	226	900	556	5,235	0	14,856
Total	7,047	43,023	4,290	188,760	13,710	17,602	1,432	12,193	18,942	16,626	16,039	71,514	17,309	3,480	23,390	1,614	14,586	9,207	22,715	80,941	29,165	18,287	61,624	31,905	85,898	14,856	826,153

Table 8.2.11. Route-wise Domestic Vessels (Likeliest Case, 2007)

OD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total
1 D.I. Ache	0	2,561	48	9,915	145	203	14	103	161	140	144	577	115	21	149	8	165	57	157	556	162	89	356	185	650	87	16,768
2 Sumatera Utara	2,561	0	271	74,624	1,020	1,244	85	592	977	800	881	3,447	651	116	828	46	1,006	319	904	3,445	895	501	2,057	1,041	3,591	477	102,377
3 Sumatera Barat	48	271	0	3,832	122	223	87	248	328	335	172	882	183	28	210	10	171	75	221	743	211	119	482	245	849	114	10,209
4 Riau	9,915	74,624	3,832	0	20,308	20,429	1,297	9,009	14,770	12,176	14,511	48,721	9,277	1,712	11,425	650	16,411	4,556	13,275	43,785	12,195	7,294	28,438	15,058	49,057	6,450	449,174
5 Jambi	145	1,020	122	20,308	0	1,326	38	350	577	521	302	1,509	266	45	312	16	577	122	422	1,356	349	200	854	401	1,320	169	32,625
6 Sumatera Selatan	203	1,244	223	20,429	1,326	0	76	747	1,153	1,010	633	3,086	518	86	581	30	1,049	216	810	2,418	662	358	1,596	727	2,392	308	41,887
7 Bengkuru	14	85	87	1,297	38	76	0	106	126	143	57	275	54	8	58	3	53	21	67	224	60	34	190	70	231	30	3,407
8 Lampung	103	592	248	9,009	350	747	106	0	2,744	4,263	593	2,434	380	65	406	21	488	152	560	1,645	422	256	1,096	512	1,616	204	29,015
9 DKI Jakarta	161	977	328	14,770	577	1,153	126	2,744	0	4,782	1,249	4,761	697	110	680	35	757	249	1,055	3,042	649	425	1,842	865	2,706	334	45,074
10 Jawa Barat	140	800	335	12,176	521	1,010	143	4,263	4,782	0	837	3,539	544	89	573	30	704	211	847	2,363	551	357	1,482	712	2,264	287	39,563
11 Jawa Tengah	144	881	172	14,511	302	633	57	593	1,249	837	0	6,576	692	108	609	31	563	219	1,162	2,616	584	396	1,889	782	2,283	280	38,166
12 Jawa Timur	577	3,447	882	48,721	1,509	3,086	275	2,434	4,761	3,539	6,576	0	6,320	1,120	4,822	234	2,909	1,563	9,080	21,916	3,709	2,889	14,417	6,340	17,047	2,001	170,176
13 Bali	115	651	183	9,277	266	518	54	380	697	544	692	6,320	0	405	1,567	67	472	354	1,421	4,354	898	690	4,672	1,688	4,411	493	41,189
14 Nusa Tengara Barat	21	116	28	1,712	45	86	8	65	110	89	108	1,120	405	0	310	14	82	69	246	884	198	133	1,041	410	884	96	8,281
15 Nusa Tenggara Timur	149	828	210	11,425	312	581	58	406	680	573	609	4,822	1,567	310	0	466	545	459	1,243	5,034	2,179	836	5,140	3,591	12,517	1,115	55,658
16 Timor Timur	8	46	10	650	16	30	3	21	35	30	31	234	67	14	466	0	28	26	65	301	134	92	308	204	949	73	3,841
17 Kalimantan Barat	165	1,006	171	16,411	577	1,049	53	488	757	704	563	2,909	472	82	545	28	0	205	640	2,377	520	355	1,399	697	2,250	285	34,708
18 Kalimantan Tengah	57	319	75	4,556	122	216	21	152	249	211	219	1,563	354	69	459	26	205	0	512	4,876	1,158	983	1,781	702	2,656	368	21,909
19 Kalimantan Seletan	157	904	221	13,275	422	810	67	560	1,055	847	1,162	9,080	1,421	246	1,243	65	640	512	0	6,799	1,166	1,051	5,158	1,839	4,796	558	54,052
20 Kalimantan Timur	556	3,445	743	43,785	1,356	2,418	224	1,645	3,042	2,363	2,616	21,916	4,354	884	5,034	301	2,377	4,876	6,799	0	9,865	14,560	27,282	8,430	21,224	2,515	192,609
21 Sulawesi Utara	162	895	211	12,195	349	662	60	422	649	551	584	3,709	898	198	2,179	134	520	1,158	1,166	9,865	0	1,771	4,772	2,737	20,910	2,645	69,401
22 Sulawesi Tengah	89	501	119	7,294	200	358	34	256	425	357	396	2,889	690	133	836	92	355	983	1,051	14,560	1,771	0	4,304	1,416	3,868	539	43,515
23 Sulawesi Selatan	356	2,057	482	28,438	854	1,596	190	1,096	1,842	1,482	1,889	14,417	4,672	1,041	5,140	308	1,399	1,781	5,158	27,282	4,772	4,304	0	13,206	20,736	2,142	146,641
24 Sulawesi Tenggara	185	1,041	245	15,058	401	727	70	512	865	712	782	6,340	1,688	410	3,591	204	697	702	1,839	8,430	2,737	1,416	13,206	0	12,738	1,324	75,920
25 Maluku	650	3,591	849	49,057	1,320	2,392	231	1,616	2,706	2,264	2,283	17,047	4,411	884	12,517	949	2,250	2,656	4,796	21,224	20,910	3,868	20,736	12,738	0	12,458	204,403
26 Irian Jaya	87	477	114	6,450	169	308	30	204	334	287	280	2,001	493	96	1,115	73	285	368	558	2,515	2,645	539	2,142	1,324	12,458	0	35,352
Total	16,768	102,377	10,209	449,174	32,625	41,887	3,407	29,015	45,074	39,563	38,166	170,176	41,189	8,281	55,658	3,841	34,708	21,909	54,052	192,609	69,401	43,515	146,641	75,920	204,403	35,352	1,965,919

Table 8.2.12. Route-wise Domestic Vessels (Likeliest Case, 2020)

Figure 8.2.1. Number of Calling Domestic Vessels in Indonesia (2001)



Ship's Calls / year

BALI, NUSA TENGGARA

Figure 8.2.2. Number of Calling Domestic Vessels in Indonesia (2007)





Figure 8.2.3. Number of Calling Domestic Vessels in Indonesia (2020)



Ship's Calls / year

8.2.6. Forecast of Marine Traffic for the Straits of Malacca and Singapore, Sea Lane I / II / III

To forecast marine traffic for the Straits of Malacca and Singapore, Sea Lane I / II / III, the following formula shall be applied. It is expressed by the **formula 8.2.8**.

 $T = a^* GDP^e$

(formula 8.2.8.)

Where

Т	: Total Cargo Volume (tonnage)								
а	: Constant								
GDP	: Gross Domestic Product								
е	: Elasticity coefficient								
(elast	cicity fit between 0.8 to 2.0. It is usual that 0.8 is adequate for an								
indu	strialized country, $1.0 \sim 2.0$ for developing country. 1.5 is fit for								
deve	loping country, in this case 1.2 should be applied.)								

The method of forecasting is described in Appendix8.2.1.

Results of the calculations based on the through-traffic volume of year 2001 are shown in **Figure 8.2.4. and Figure 8.2.5**, which are forecasted in 2007, 2020 of likeliest case respectively.



Figure 8.2.4. Forecast of Daily Marine Traffic in the Straits of Malacca and Singapore, Sea Lane I / II / III in 2007



Figure 8.2.5. Forecast of Daily Marine Traffic in the Straits of Malacca and Singapore, Sea Lane I / II / III in 2020

8-22

8.2.7. Passenger Volume

Forecast in 2007 and 2020 shall be estimated separately for domestic passenger volume under administration of DGSC and ferryboat passenger volume under administration of DGLC.

(1) Domestic passenger volume under administration of DGSC

Domestic passengers under administration of DGSC are the passengers, who travel among sea ports. There are close correlations between social indices showed by socio-economic framework and passenger volume. It is estimated by regression curve between GDP and domestic passenger volume, which are shown in **Table 8.2.13**.

Formula 8.2.9 is obtained.

Y=3.871 Ln(x)+1.1717 (Formula 8.2.9) R²=0.7998

Table 8.2.13. Domestic Passenger Volume under administration of DGSC

	Year	GDP (Billion Rupiah)	GDP Ratio		Passenger Ratio	Ln(x)	3.871Ln(x)+ 1.1717	Passenger (Person)
	1993	329,775.8		1.000	1.000			6,146,356
	1994	354,640.8		1.075	1.631			10,025,195
	1995	383,792.3		1.164	1.909			11,732,354
	1996	413,797.9		1.255	1.894			11,640,163
	1997	433,245.9		1.314	1.349			8,291,120
	1998	376,374.9		1.141	1.788			10,988,111
	1999	379,557.7	1.000	1.151			1.000	14,621,340
	2000	397,666.3	1.048			0.047	1.353	19,785,398
Likeliest	2007	603,544	1.590			0.464	2.967	43,378,802
Case	2020	1,368,527	3.606			1.283	6.137	89,725,918
Optimistic	2007	665,842	1.754			0.562	3.347	48,934,856
Case	2020	1,810,840	4.771			1.563	7.220	105,571,251
Pessimistic	2007	546,310	1.439			0.364	2.581	37,731,017
Case	2020	1,030,148	2.714			0.998	5.037	73,641,806

(2) Domestic passenger volume under administration of DGLC

There is no correlation between GDP and passenger volume. The clear reasons couldn't be clarified, but passenger volume shall change with the change of the past trend

Therefore passenger volume by DGLC is estimated 0.7 % increase every year. Domestic passenger volume is shown in **Table 8.2.14**.

Table 8.2.14. Domestic Passenger Volume under administration of DGLC

Passenger volume
39,004,338
44,940,901
45,513,415
44,059,708
44,587,842
45,749,549
42,852,763
40,538,869
42,567,478
46,608,061

Unit: Persons

8.2.8.Light Dues

Total amount of light dues are forecasted according to vessels volume as shown in **Table 8.2.15**.

Table 8.2.15. Forecasted Total Amount of Light Dues

Unit: USD

Year	Likeliest Case	Optimistic case	Pessimistic case
2001	13,094,871	13,094,871	13,094,871
2007	21,011,787	23,910,529	18,437,133
2020	48,762,475	69,967,924	33,843,512
CHAPTER 9.

EVALUATION OF EXISTING MARITIME TRAFFIC SAFETY SYSTEM

CHAPTER 9. EVALUATION OF EXISTING MARITIME TREFFIC SAFETY SYSTEM

9.1. Aids to Navigation System

9.1.1. Visual Aids to Navigation

The current situation of visual aids to navigation in Indonesia was confirmed through the site survey and the preparation of Inventory.

(1) Visual aids to navigation of Property of DGSC

There are one thousand seven hundred thirty-five (1,735) units of lighted visual aids to navigation and three hundred sixty-three (363) units of unlighted visual aids to navigation operated and maintained by the District of Navigation Offices (DISNAV/ Sub DISNAV) under DGSC.

These lighted and unlighted visual aids to navigation are categorized as follows:

Lighthouse	235 units
Light beacon (including harbor light)	1,168 units
Light Buoy	332 units
Unlighted beacon	260 units
Unlighted buoy	103 units

The category of light beacon includes leading light and sector light. Resilient Light Beacon (RLB) is categorized into the light beacon. The light beacon includes six (6) units of RLBs in the total numbers.

The number of visual aids to navigation operated and maintained by each DISNAV/ Sub DISNAV is shown in **Table 9.1.1**.

(2) Visual aids to navigation of Non-property of DGSC (NON-DGSC)

There are eight hundred thirty-three (833) units of lighted visual aids to navigation and one hundred fifty (150) units of unlighted visual aids to navigation operated and maintained by private companies, state-owned companies and other organizations such as State-Owned Oil Company (PERTAMINA).

No. of light in the List of Light (DSI: Daftar Suar Indonesia) for the non-property light is managed by the DGSC as well as property light. The lighted and unlighted visual aids to navigation of non-property are categorized as follows;

Light beacon	437 units
Light buoy	396 units
Unlighted beacon	105 units
Unlighted buoy	45 units

The category of light beacon includes leading light and sector light. The light beacon includes one (1) unit of RLB in the total numbers.

The number of visual aids to navigation operated and maintained as non-property aids at the operational area of each DISNAV/ Sub DISNAV is shown in **Table 9.1.1**.

Table 9.1.1. Number of Visual Aids to Navigation in Service

As of July 31, 2001

		Light	1.1.1.1		Lielet Durau		Un lie	tted		10	÷.,
NO.	Name of DisNav	house	Light E	Beacon	Light	Buoy	Dea	luon	Unlighte	ed buoy	lotal
			DGSC	NUN- DGSC	DGSC	NUN- DGSC	DGSC	NUN- DGSC	DGSC	NUN- DGSC	
1	Sabang	9	31	3	4	4	4	0	2	0	57
2	Be lawan	5	45	15	27	27	1	1	1	0	122
3	Sibolga	7	46	5	0	0	3	3	0	4	68
4	Dumai	5	34	5	54	16	3	9	2	0	128
5	Tg.Pinang	22	71	37	26	57	60	0	11	0	284
6	Tlk.Bayaur	8	40	5	0	1	2	0	0	0	56
7	Palembang	4	63	0	16	6	8	0	4	0	101
8	Te.Priok	27	96	81	45	38	22	0	48	0	357
9	Semarang	7	31	4	12	4	19	8	0	4	89
10	Cilacap	6	17	11	5	36	0	10	0	20	105
11	Surabaya	19	58	12	36	21	0	4	21	4	175
12	Benoa	15	57	13	8	8	12	0	1	3	117
13	Pontianak	3	42	1	14	0	6	0	2	0	68
14	Banjarmasin	7	38	49	18	14	14	2	0	0	142
15	Samarinda	5	48	137	17	134	4	16	9	10	380
16	Tarakan	2	24	0	6	10	1	0	0	0	43
17	Manado/Bitung	21	84	1	7	6	6	9	0	0	134
18	Kendari	6	62	13	0	1	6	22	0	0	110
19	Ujung Pandang	18	50	0	8	0	64	14	0	0	154
20	Kupang	13	48	10	3	0	10	2	0	0	86
21	Ambon	12	71	22	5	4	8	0	0	0	122
22	Jayapura	7	34	0	0	0	4	1	0	0	46
23	Sorong	6	52	13	17	9	3	4	0	0	104
24	Merauke	1	26	0	4	0	0	0	2	0	33
		235	1168	437	332	396	260	105	103	45	3081
	Total	235	16	05	72	8	30	65	14	8	3081
				2568				51	3		3081

(3) Achievement of the target number of visual aids to navigation

The changes of number of visual aids to navigation by type are shown in **Figure 9.1.1**. The increasing ratio and achieving ratio are also shown in **Figure 9.1.1**. These number and ratios are based on the number of visual aids to navigation in the of Master Plan in 1985 and as of July 31, 2001.

The total number of lighted visual aids to navigation (lighted visual ATN) as of July 31, 2001 is 2,568 units. 1,476 units of the lighted visual ATN were developed up to year 2001 after the Master Plan in 1985.

The increasing ratio is figured with 2.35. Also, it shows 1.28 of the achieving ratio compared with the number planned in Master Plan in 1985 for the lighted visual ATN.

When the changes of number are analyzed by type of lighted aids, the lighthouses, which had been planned as mostly landfall marks, are remaining to figure 0.67 of achieving ratio.

The light buoys were developed nearly in accordance with the Master Plan in 1985.



Figure 9.1.1. Changes of Numbers of Visual ATN by Type

However, the increase of Non-property lights has largely contributed to achieve the ratio of 1.28 for the first target number of lighted visual ATN in the Master Plan in 1985.

The Non-property lights have increased the number by nearly four (4) times. The locations of non-property lights of both the light beacons and light buoys are shown in **Figure 9.1.2.** and **Figure 9.1.3.** respectively.

The locations are remarkably met with the features of port such as the oil base and so forth.



Figure 9.1.2. Locations of Non-property Light Beacon

9-1-5



Figure 9.1.3. Locations of Non-property Light Buoy

9-1-6

(4) Availability of lighted visual ATN

The availability of lighted visual ATN recommended by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) is shown as the following categories;

Category 1:

Major lighthouses, leading lights and manned light vessels have an availability exceeding 0.998.

Category 2:

Other lights on fixed structures (means "light beacon") have an availability exceeding 0.99.

Category 3:

Light buoys have an availability ranging from 0.999 to 0.97, depending on local conditions and type of power supply.

In the absence of specific considerations for operation, the categories of availability should be:

Category 1:	Availability at least 99.8%
Category 2:	Availability at least 99%
Category 3:	Availability at least 97%

and that the absolute minimum level of availability should be set at 95%.

The availability of an aid to navigation may be calculated by dividing the mean time between failure (MTBF) by the sum of the mean time between failures and the mean time to repair (MTTR).

Availability may also be calculated by the total time during which the aids has been operating correctly by the total time during which the function to be performed by the aids to navigation should have been fulfilled. An appropriate period of time should be used for the calculation of aid availability. This period should be sufficiently long and in any event longer than 2 years – to ensure that the calculated availability represents long-term aid performance.

In this survey, the availability of lighted visual aids to navigation for each District of Navigation Offices (DISNAV/Sub DISNAV) is calculated as reference data only, based on the annual report of fiscal year 2000 (April to December 2000) of each DISNAV/Sub DISNAV and annual report of Directorate of Navigation, DGSC in order to confirm the days in service of lighted visual aids to navigation.

The reference data for an availability of lighted visual ATN is shown in **Table 9.1.2**.

The annual report of DISNAV Sibolga and DISNAV Surabaya was mentioned on the total days only out of services.

There was no information in the annual report on the Sub DISNAV Pontianak, DISNAV Samarinda, DISNAV Ujung Pandang (Makassar) and DISNAV Ambon.

Table 9.1.2. Availability of Lighted Visual Aids to Navigationfor Each DISNAV/Sub DISNAV (Reference Only)

As of December 31,2000

		NO. of											
NO	District of	lighted			<u>Total E</u>	ays un	lighted	 	-	-	-	-	
	Navigation	ATN	Apr.	Mav	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total	Availavility
1	Sabang	42	0	0	0	0	37	33	33	95	95	293	97.46%
2	Belawan	78	184	190	185	188	232	219	233	202	196	1829	91.47%
3	Sibolga	50	*	*	*	*	*	*	*	*	*	1677	87.80%
4	Dumai	91	90	91	90	62	62	60	62	60	62	639	97.45%
5	Tg.Pinang	114	0	0	0	279	279	0	0	0	0	558	98.22%
6	Tlk.Bayaur	55	76	0	0	0	124	0	0	0	0	200	98.68%
7	Palembang	84	0	0	0	0	403	0	0	0	0	403	98.26%
8	Tg.Priok	155	0	816	756	1462	1023	0	403	0	0	4460	89.54%
9	Semarang	49	30	0	159	0	162	0	0	0	0	351	97.40%
10	Cilacap	29	0	151	228	278	329	240	0	0	0	1226	84.63%
11	Surabaya	97	*	*	*	*	*	*	*	*	*	66	99.75%
12	Benoa	74	91	119	0	0	0	0	0	0	0	210	98.97%
13	Pontianak	58	-	-	-	-	-	-	-	-	-	-	**
14	Banjarmasin	64	0	0	0	463	0	0	527	0	0	990	94.38%
15	Samarinda	68	-	-	-	-	-	-	-	-	-	-	**
16	Tarakan	37	0	138	0	186	0	0	0	0	0	324	96.82%
17	Manado /Bitung	105	0	125	0	111	95	0	0	120	0	451	98.44%
18	Kendari	69	210	93	0	93	217	0	0	0	0	613	96.77%
19	Makassar	76	-	-	-	-	-	-	-	-	-	-	**
20	Kupang	71	0	0	0	0	0	90	0	0	0	90	99.54%
21	Ambon	86	-	-	-	-	-	-	-	-	-	-	**
22	Jayapura	43	0	0	0	85	56	60	0	57	0	258	97.82%
23	Sorong	73	72	62	0	0	0	0	31	90	92	347	98.27%
24	Merauke	31	0	0	180	186	186	0	0	240	0	792	90.71%

Note: Source: DGSC

* shows that data of total days unlighted was given in annuals reports. ** shows no data.

Fiscal year 2000: April 1, 2000 to December 31, 2000.

Availability =

(1- Total days unlighted / Number of lighted ATN $\,x\,275$ days) x 100\%

In connection with the availability of lighted visual ATN shown in **Table 9.1.2.**, there are some lights with availability which indicate less than 95% of IALA recommendation.

That is DISNAV Belawan, DISNAV Sibolga, DISNAV Tanjung Priok, Sub

DISNAV Cilacap, DISNAV Banjarmasin and Sub DISNAV Merauke.

The following causes of failure, which reduced availability by less than 95%, are confirmed in the Site Survey;

Theft Collision by boat Collapse Sunken/drift Shortage of spare parts Limited budget Lack of information

In the causes of failures above, the theft of lightning equipment, solar cell and so forth is very serious issue that reduces the availability of visual aids to navigation.

Especially, batteries and solar cells are stolen frequently as compared with that the lighted visual ATN, energized by acetylene gas are hardly stolen. Some DISNAV/ Sub DISNAV use acetylene gas for such location to prevent the theft.

(5) Energy source

Current situation of energy source used for existing lighted visual ATN is shown in **Table 9.1.3**. There are 1,623 units of the lighted visual ATN operated by electricity and 112 units of the lighted visual ATN operated by acetylene gas.

The ratio of electricity for energy source has increased to 93.5% from 46% in the Master Plan in 1985.

	Electricity	Acetylene Gas	Total
Lighthouse	235	0	235
Light Beacon	1,115	53	1,168
Light Buoy	273	59	332
Total	1,623	112	1,735
	(93.5%)	(6.5%)	(100%)

 Table 9.1.3. Current Situation of Energy Source of Lighted Visual ATN

Source : Result of the Study of Inventory

(6) Material of light tower

The materials of the light towers for the lighted visual aids to navigation are confirmed by the result of study of inventory prepared by the local consultant.

The materials of the light towers for the lighthouses and the light beacons except non-property lights are summarized in **Table 9.1.4**. and **Table 9.1.5**., respectively.

Light tower of lighthouse

The wooden light tower for lighthouse was replaced with other materials after the Master Plan in 1985.

The reinforced concrete, which requires the quality control of concrete, was newly utilized as the light tower material of lighthouse considering long lifetime. Some light towers are made of stone, which have a historical worth, were eliminated.

The galvanized steel lattice tower remarkably increased in order to shorten the period of installation work, and to estimate costs conservatively.

No.	Material	Quantity		Ratio	Remarks			
1	Reinforced Concrete (RC)	14	units	5.9%				
2	Cast Iron	16	units	6.8%				
3	Steel Lattice	201	units	85.5%	Galvanized			
4	Stone	2	units	0.9%				
5	Hybrid Tower	2	units	0.9%	RC+ Steel			
					Lattice			
	Total	235	units	100%				

Table 9.1.4. Materials of Light Tower for Lighthouse

Source: Inventory

Light tower of light beacon

The glass fiber reinforced plastic (GRP) and reinforced concrete were newly introduced as the materials for light tower of light beacon.

The GRP can shorten the construction period.

The materials for light tower of the light beacon constructed since 1985 were GRP and galvanized steel. It was considered to be good workability, to shorten construction period and to estimate costs conservatively.

_			0		
No.	Material	Quar	ntity	Ratio	Remarks
1	Reinforced Concrete	37	units	3.2%	
	(RC)				
2	Steel Lattice	764	units	65.4%	Galvanized
3	Glass fiber Reinforced	223	units	19.1%	
	Plastic (GRP)				
4	Cast Iron	4	units	0.3%	
5	Hybrid Tower	2	units	0.2%	RC+ GRP, or
					RC + Steel Lattice
6	Steel Pole	41	units	3.5%	
7	Stone	1	units	0.1%	
8	Wooden pole or frame	20	units	1.7%	
9	Others	76	units	6.5%	Platform, etc.
	Total	1,168	units	100%	

Table 9.1.5. Materials of Light Tower for Light Beacons

Source: Inventory

(7) Current situation of lighthouse

The current situation of the lighthouses was confirmed on the basis of the result of site survey and study of inventory on the following points:

Operation Status (Light off: Out of services, Light on: In services) Condition of Lighting Equipment Condition of Power Supply Condition of Light Tower

The lighthouses that have an improper operation status are shown in **Appendix 9.1.1**. The conditions of equipment for these lighthouses are summarized in **Table 9.1.6**.

					0				
No.	Operation	Lighting	Power	Light	Number of				
	Status	Equipment	Supply	Tower	Lighthouses				
1	Light off	Damaged	Damaged	Collapsed	3 units				
2	Light off	Good	Good	Collapsed	2 units				
3	Light on	Degrading	Degrading	Degrading	13 units				
4	Light on	Good	Good	Degrading	10 units				
5	Light on	Degrading	Degrading	Good	7 units				

Table 9.1.6. Conditions of Equipment for Lighthouses

(8) Current situation of light beacon

The current situation of the light beacons was confirmed on the basis of the result of site survey and study of inventory on the following points:

Operation Status (Light off: Out of services, Light on: In services) Condition of Lighting Equipment Condition of Power Supply Condition of Light Tower

The light beacons that have an improper operation status are shown in **Appendix 9.1.2.** The conditions of equipment for these light beacons are summarized in **Table 9.1.7**.

NT.	0	T talation of	Demon	I talet Terrer	Number of
INO.	Operation	Lighting	Power	Light Tower	inumber of
	Status	Equipment	Supply		Light
					Beacons
1	Light off	Damaged	Damaged	Collapsed	65 units
2	Light off	Damaged	Damaged	Degrading	47 units
3	Light off	Good	Good	Degrading	1 unit
4	Light off	Damaged	Damaged	Good	8 unit
5	Light on	Degrading	Degrading	Degrading	16 units
6	Light on	Good	Good	Degrading	50 units
7	Light on	Degrading	Degrading	Good	7 units
		Total			194 units

 Table 9.1.7. Conditions of Equipment for Light Beacons

(9) Current situation of light buoy

The current situation of the light buoys was confirmed on the basis of the result of site survey and study of inventory on the following points:

Operation Status (Light off: Out of services, Light on: In services) Condition of Lighting Equipment

Condition of Power Supply

Condition of Light Tower

The light buoys that have an improper operation status are shown in **Appendix 9.1.3**. The conditions of equipment for these light buoys are summarized in **Table 9.1.8**.

			<u> </u>	<u> </u>	V
No.	Operation	Lighting	Power	Buoy Body	Number of
	Status	Equipment	Supply	& Super	Light
				Structure	Beacons
1	Light off	Missing	Missing	Missing	18 units
2	Light off	Missing	Damaged	Damaged	3 units
3	Light off	Damaged	Damaged	Damaged	2 unit
4	Light off	Degrading	Degrading	Degrading	25 unit
5	Light off	Good	Good	Damaged	1 units
6	Light on	Good	Good	Degrading	12 units
		Total			61 units

 Table 9.1.8. Conditions of Equipment for Light buoys

(10) Historical Lighthouse

There are twenty-seven (27) historical lighthouses in Indonesia, which is aged more than 100 years old, as given in **Table 9.1.9**.

The historical lighthouses Indonesia were constructed by the Netherlands. Those are mostly located at west coast of Sumatra, coastal lines faced to Jawa Sea, around Makassar of southwest of Sulawesi Is and around Ambon in compliance with historical background of Indonesia.

Cikoneng lighthouse, which was wooden light tower with kerosene light lantern, was constructed by the Netherlands at first in Indonesia. After the first lighthouse was burnt, the lighthouse made of bricks was constructed. However, the brick lighthouse was collapsed by the tsunami when Mt. Kratatau was erupted in 1883. The existing Cikoneng lighthouse made of cast iron was re-constructed in 1885. Only the brick foundation of the second construction still remains at 20m off the existing lighthouse.

Fifteen (15) lighthouses are made of cast iron. Those cast iron blocks were produced in the Netherlands and assembled on each sites. Three (3) lighthouses are made of stone that are Breueh lighthouse (44m) constructed in 1875, Tg. Kelian lighthouse (50m) constructed in 1862 and Bramas lighthouse (14m) constructed in 1882. Cimiring lighthouse is made of stone and concrete. The remaining seven (7) lighthouses have steel lattice towers.

Seventeen (17) lighthouses are aged around 90 years old. Those are made of cast irons or steel lattice structures. Until now, many historical lighthouses have been replaced with the galvanized steel lattice tower.

No.	Name of Lights	Height (m)	Material	DSI No.	Year of Construction	DISNAV
1.	Breueh/ P. Beras	44	Stone	50	1875	Sabang
2.	Tg. Kelian	50	Stone	1550	1862	Palembang
З.	P. Nangka	35	Cast iron	1600	1895	Tg. Priok
4.	P. Besar	57	Cast iron	1640	1886	Tg. Priok
5.	P. Dapur	14	Steel lattice	1660	1864	Tg. Priok
6.	P. Jaga Utara	48	Steel lattice	1690	1869	Tg. Priok
7.	P. Damar Besar	52	Cast iron	1720	1883	Tg. Priok
8	P. Simedang	57	Cast iron	1860	1882	Tg. Priok
9.	Mendanau	27	Cast iron	1870	1883	Tg. Priok
10.	Langkuas	57	Cast iron	1880	1880	Tg. Priok
11.	Cikoneng/Anyer	58	Cast iron	2260	1885	Tg. Priok
12.	P. Belimbing	61	Cast iron	2290	1880	Tg. Priok
13.	Bramas	14	Stone	2570	1901	Tlk. Bayur
14.	Bojo	60	Cast iron	2650	1882	Tlk. Bayur
15.	P. Rakit	50	Cast iron	2990	1873	Tg. Priok
16.	Cirebon	30	Steel lattice	3020	1857	Tg. Priok
17.	Semarang I	30	Cast iron	3200	1884	Semarang
18.	P. Mandalika	16	Cast iron	3290	1886	Semarang
19.	Sembilangan	50	Cast iron	3510	1882	Surabaya
20.	Sapudi	59	Cast iron	4000	1887	Surabaya
21.	Cimiring	3.2	Stone+Concrete	4100	1854	Cilacap
22.	Samber Gelap	14	Cast iron	4610	1901	Banjarmasin
23.	De Brill(Offshore)	23	Cast iron	4910	1886	Makassar
24.	Tg. Karang	21	Steel lattice	5110	1901	Bitung
25.	Gorontaro	6	Steel lattice	5490	1883	Bitung
26.	Wangi Wangi	21	Steel lattice	5580	1886	Ken dari
27.	P. Suanggi	21	Steel lattice	5910	1882	Ambon

Table 9.1.9. Historical Lighthouse in Indonesia

9.1.2. Radio Aids to Navigation

(1) Current situation of MFB stations

Eighteen MFB stations were established by Japan's Yen loan of 1982 fiscal year in order to secure navigation safety and promote efficiency of sea traffic in the waters with busy traffic in Indonesia.

However, most of the MFB stations have stopped their operation by 1996. The major reasons were the failure of power supply system and so forth, but they have not been recovered because of weakness of management and maintenance system including a lack of budget, difficulty of access to the sites, and complex factors such as lightning attack, salty wind and rain and so forth, which were not estimated to be so frequent at the time of planning.

As of the end of September 2000, only one (1) station of No.1 Sabang MFB was still operated. It has also been stopped operation because of a lack of operation and maintenance budget.

In this site survey, the following MFB stations of five (5) locations are surveyed to confirm the current situation of facilities and equipment of MFB stations.

No. 1 MFB Sabang

The facilities and equipment for No.1 MFB station Sabang, whose operation was intentionally stopped, are still in good condition. The facilities and equipment have been maintained in order to re-operate station anytime, according to the result of hearing survey at the DISNAV Sabang.

No. 7 MFB Cilacap

a. 45m high vertical antenna tower collapsed. Security's house near the antenna tower had been damaged when the tower collapsed.

- b. No.3 engine generator can be re-used subject to overhaul to be done, and No.1. No.2 engine generator cannot be re-used independently. No.1 and No.2 engine generator can be used using spare parts of No.3 engine generator.
- c. The surfaces of transmitter, goniometer and power supply system were rusty.
- d. The lighthouse keepers of Klirong Lighthouse that was established at the next area of MFB are managing the facilities and equipment of MFB station.
- e. There are some deformation on wall and floor, and their fitted equipment such as air ventilation system is rusty.

No. 8 MFB Jamuang Is.

a. Antenna system including goniometer and 45m high vertical antenna tower is in good condition.

b. Transmitter was in good condition according to the visual inspection. Operation was stopped in April 1998.

c. Monitoring equipment is still able to operate.

d. Power supply system except No. 1 engine generator is in good condition. No.2 and No.3 engine generators still supply power source to Jamuang lighthouse and all housing and telecommunication equipment in Jamuang Is.

No. 11 MFB Balikpapan

a. Antenna system including 45m high antenna tower is good except goniometer.

b. Engine generator as emergency power source can operate. Power supply system other than emergency engine generator is rusty.

c. Transmitter and goniometer are rusty.

No. 14 MFB Dewakang Besar Is./ RS Dayang Dayangan Is.

a. Engine generator can be used subject to overhaul. Power supply system

other than engine generator is rusty.

- b. Relay communication equipment is rusty.
- c. 25m high steel pole-tower with guy has been collapsed.

No. 16 MFB Talisei Is.

- a. Antenna system including goniometer and 45m high vertical antenna tower is good.
- b. No.1 engine generator is malfunctions. No.2 and No.3 engine generator are in good operational condition. They supply power source to lighthouse and lighthouse keepers housing.
- c. Transmitter, goniometer and power supply system other than engine generators are good according to the visual inspection.

Other than MFB stations above, the survey was carried out with hearing at DISNAV and/or DGSC. Current situation of MFB stations in Indonesia is summarized in **Figure 9.1.4**. and **Table 9.1.10**.



Figure 9.1.4. Location Map of 18 MFB Stations in Indonesia

9-1-17

	in Indonesia							
No.	Name of	Status	Time of	Major Causes of	Remarks			
	Station		Operation	operation Stop				
			Stop					
1	Sabang	Stop	31 Dec. 2000	Malfunction of DC/DC	Some times operation is stop.			
		Intenti-		Converter in Charger	Technician on site recover			
		onally			system			
2	Simedang Is.	Stop	1995	Malfunction of DC/DC				
				Converter in Charger				
3	Peniki Is.	Stop	31 Mar. 1998	Malfunction of DC/DC				
				Converter in Charger				
4	Pontianak	Stop	25 Jun. 1993	Malfunction of DC/DC	Engine generator can use.			
				Converter in Charger	TX room floor collapsed, TX			
					& cables were removed.			
5	Pesemut Is.	Stop	18 Oct. 1995	Malfunction of DC/DC	Foundation for guy wire was			
				Converter in Charger	collapsed. 45m Ant will be			
		-			collapsed			
6	Muria	Stop	20 Jan. 1994	Malfunction of DC/DC				
		-		Converter in Charger				
7	Cilacap	Stop	1994	Malfunction of DC/DC	Comm. Line b/w Cimiring			
		-		Converter in Charger	LH & SROP is good.			
8	Jamuang Is.	Stop	9 Apr. 1998	Malfunction of DC/DC	Engine generator only are			
		Intentio		Converter in Charger	operated for facilities &			
		nally			equip. in Jamuang Is.			
9	Tg. Selatang	Stop	14 May 1992	Malfunction of Antenna	Hook metal of Loop ant are			
		-		System by salty air	corroded. Ant will collapse.			
10	Benoa	Stop	8 Apr. 1991	Malfunction of DC/DC	45m high Ant will collapse			
				Converter & Antenna Sys.	due to some guy wires come			
	D 141	C.	00 T 1000	by salty air	off			
11	Balikpapan	Stop	26 Jun. 1996	Malfunction of DC/DC				
10	-	C.	00.0 1001	Converter in Charger				
12	Tg.	Stop	23 Sep. 1991	Malfunction of DC/DC				
10	Mangkalihat	C.	Z A 4000	Converter in Charger				
13	Tg. Mandar	Stop	5 Aug. 1993	Malfunction of DC/DC				
		C.		Converter in Charger				
14	Dewakang	Stop	3 Oct. 1993	Malfunction of Antenna				
4.5	ls.	C.	0 NI 4004	System by salty air				
15	Ambon	Stop	3 Nov. 1994	Malfunction of				
10	— 11 1	C.	1000	Transmitter				
16	Talisei	Stop	1992	Maltunction of DC/DC	Engine generator still be			
1~	9	<u></u>	1001	Converter & Antenna Sys.	used for Talisei LH.			
17	Sorong	Stop	1994	Unknown	Engine generator still be			
4.0			1000		used for P. Buaya LH			
18	Merauke	Stop	1992	Malfunction of DC/DC	Engine generator can use.			
				Converter & Transmitter				

 Table 9.1.10. Summary of Current Situation of MFB Stations

(2) Radar Beacon (Racon) Stations

There are eighty-four (84) Racon stations in Indonesia, which were co-sited at the major lighthouses and light beacons mainly as landfall marks and danger marks. The locations of Racon stations are shown in **Figure 9.1.5**. and **Appendix 9.1.4**.



Figure 9.1.5. Locations of RACON Stations in Indonesia

Most of the Racons in Indonesia, however, stopped their operation due to the malfunction. The Racon stations that are out of services are shown in **Figure 9.1.5**.

In this site survey, it is confirmed that only two (2) Racon stations have been fully operated with their specified function, which are installed at the top platform of De Brill lighthouse of DISNAV Makassar as an isolated danger mark and Nipah Larangan lighthouse of DISNAV Belawan.

One (1) of Racon equipment, which is stored at DISNAV Dumai before the collapse of light beacon co-sited, can be utilized for operation and maintenance.

The major cause of malfunctions is lightning attack, which account for about 30% of causes of malfunctions. The lighthouses and light beacons as landfall mark, with which the Racon equipment is co-sited, mostly locate at open area such as the end of capes and islands that are apt to receive lightning attack.

In connection with lightning attack, the top of antenna for Racon equipment, which is at about 30cm above the top horizontal surface of lightning rod, was found in Talisei lighthouse of DISNAV Manado/Bitung. The main part of this Racon equipment exists almost out of lightning protection angle of lightning rod.

Other major reason of operational stop is the difficulty of recovering their function because of lack of spare parts due to procurement problem. And also, there is lack of technicians who are familiar with the Racon maintenance.

(3) Differential Omega

There are five (5) differential omega stations co-sited and established in 1989 at the MFB Stations. The locations of differential omega stations are shown in **Table 9.1.11**.

		8
No.	Name of Station	Co-sited at:
1	Sabang	No.1 Sabang MFB Station
2	P. Peniki	No.3 Peniki MFB Station
3	Mempawah	No. 4 Pontianak MFB Station
4	Dewakang Besar	No.14 Dewakang Is. MFB Station
5	Merauke	No.18 Merauke MFB Station

Table 9.1.11. Location of Differential Omega Stations

The differential omega was a system to improve the position accuracy of omega

system. However, the whole omega stations in the world were closed in September 1997. The Tsushima Omega station in Japan was also closed, and the station facilities and equipment including 400m high antenna tower were dismantled completely in March 2000.

There is no omega station and differential omega station in the world other than differential omega in Indonesia.

9.1.3. Supporting Facilities

For the operation and maintenance of visual aids to navigation services, the supporting facilities are categorized as follows:

- Workshop and buoy bases
- Vessels for aids to navigation services

(1) Buoy Bases and Workshop including associated facilities

Buoy base including open storage

There are nine (9) buoy bases to maintain all buoys in the whole area of Indonesia. On this site survey, the sites for 2 buoy bases were found to be not sufficient for their work.

There is a buoy base where no buoy bodies are stored, despite that mooring chains, shackles and sinkers are stored.

The occupied areas of buoy bases and open storages are shown in Table 9.1.12.

Workshop including storage and jetty

Workshops belong to all District of Navigation except one District. The area of workshop is not sufficient for maintenance work of ATN equipment in several districts. Tools and machines of workshop equipment are old and deficient.

Development of Jetty as supporting facility for aids to navigation is required to deploy vessels quickly at a number of District Navigation. There are three (3) places of District Navigation with small exclusive jetties and ten (10) places of District Navigation with no jetties. The occupied area of workshop, storage and jetty are shown in **Table 9.1.12**.

Table 9.1.12. Areas of Workshop and Buoy Base of Each District ofNavigation

As of Mar. 2001

No	ATN Office	ID No	Work Shop (m²)	Jetty	Storage	Open Storage	Buoy Base (m²)	Office	Workshop Equipment	Remarks
1	CADANC	1	(III~)	(11)	(III~)	(111~)	(111~)	(111~)	¥	
1	SABANG	1	80	40	80	0	0	360	*	
2	BELAWAN	2	142	38	242	0	415	282	*	
3	SIBOLGA	3	80	0	80	0	0	200	*	
4	DUMAI	4	550	70	352	0	1,000	810	*	
5	TG.PINANG	5	230(600)	40	170	0	0	1,000	KfW	** ****
6	TLK BAYUR	6	200	40	135	0	0	250	*	* * *
7	PALEMBANG	7	550	33	350	0	300	550	*	
8	TG.PRIOK	8	2,050	175	3,315	150	5,900	2,000	KfW	
9	SEMARANG	9	280	40	80	0	0	784	*	
10	CILACAP	10	160	25	0	0	300	550	*	
11	SURABAYA	11	770	115	285	165	732	2,625	*	
12	BENOA	12	80(600)	0	0	0	0	215	KfW	* * * *
13	PONTIANAK	13	600	0	0	0	0	550	KfW	
14	BANJARMASIN	14	80	0	0	0	0	318	*	
15	SAMARINDA	15	1,600	50	416	200	2,956	550	*	
16	TARAKAN	16	0	0	0	0	0	750	*	
17	MANADO/BITUNG	17	600	0	80	0	750	735	IP-380	
18	KENDARI	18	600	0	0	0	0	300	IP-394	
19	UJ.PANDANG	19	400	40	177	0	0	400	IP-380	
20	KUPANG	20	200	0	0	0	0	418	IP-394	
21	AMBON	21	80(600)	40	80	0	0	844	KfW	* * * *
22	JAYAPURA	22	426	0	55	0	0	375	*	
23	SORONG	23	600	40	120	120	750	420	IP-394	
24	MERAUKE	24	335	0	464	0	0	150	*	
25	ВТКР	25	600	75	1,255			1,200	*	

** Workshop and Buoy Base of Tg.Pinang to be established at Kijang in fiscal year 2001(December).

*** Office of Tlk Bayur burnt down in Sept. 2001, will be changed to Tlk Bungus.

**** Shows that workshop with $600m^2$ area will be established in fiscal year 2002.

KfW Ongoing(Navigational Safety Project in Indonesia).

(2) Acetylene Gas plant

The sole gas plant in DGSC is still operated under a proper maintenance and repairs.

It has a production capacity of 1,500 bottles per year as of March 2001. Gas bottles are even now able to be procured in domestic markets. Carbide as a raw material for acetylene gas can also be procured in domestic markets, and it is produced in Surabaya. However, it should be also considered that the production capacity declined at a yearly rate of about 3 %.

The production waste of about 4.8 ton per year is exposed to the weather on an adjacent field near the river; it should be stored in the proper container or properly disposed in light of the influence on environment.

(3) Procurement of spares

The procurement of spare parts for lighting facilities and equipment developed and improved by several ODA loans or own budget in and after the middle of 1980's is still possible in domestic markets through the sole agent or agents in Indonesia.

The spare parts for aged equipment and facilities other than the above are very difficult to procure in the market. National budgetary crisis in recent years made it further difficult to procure spare parts necessary and indispensable for operation and maintenance. Every DISNAV/Sub DISNAV maintains lights with tearful efforts under limited budget for operation and maintenance.

For example, an acrylic fresnel lens was made by staffs in DISNAV Palembang. They made a lens through all production stages including a molding frame for a primary acrylic mass and a cutting stage for fresnel lens by using lathe of workshop. However, it is very difficult to finish up the face of lens to satisfy a luminous range originally specified to the lighting equipment.

There is an aged lighting equipment, whose lamp has been changed to the lamp possible to procure in Indonesian markets in some DISNAV/Sub DISNAV.

Under those circumstances, the procurement problem of spare parts is one of the reasons of lower availability of less than 95%, recommended by a figure of IALA for lighted visual aids to navigation.

This procurement problem is not only for lighted visual aids to navigation but also for radio aids to navigation and supporting facilities.

(4) Local requirements Tanjung Pinang It is required to develop a lift and crane for buoy base and equipment of sandblast for workshop.

Pontianak

Development of a buoy tender and an inspection boat are required because of old age of the existing vessels.

Banjarmasin

It is required to develop a jetty, a workshop, and a buoy tender.

There is no buoy tenders at this District of Navigation.

Neighboring District of Navigation Offices are also insufficient. Samarinda

On account of oldness of the buoy tender, the aids to navigation are not maintained satisfactorily for one (1) year. It is required to develop a buoy tender and to supply spare parts for rehabilitation of seventeen (17) units of aids to navigation.

Tarakan

It is required to rehabilitate a workshop and to develop a inspection boat. Kendari

It is strongly requested to develop a Jetty for buoy base.

Makassar

It is required to develop two (2) inspection boats, a buoy tender and an approach boat, because inspection for aids to navigation facilities within five (5) nautical miles are done by a chartered boat. It is also required to develop a office space and a jetty.

Kupang

It is required to improve its workshop, jetty and buoy base. Especially, the workshop is not safe on account of limited area.

It is required to develop one (1) inspection boat, two (2) high-speed boats and two (2) landing boats.

There are many requirements other than mentioned above from each District of Navigation Offices, which are described in List of Project Proposal (DUP) every year. They will be considered for the preparation of Short Term Plan up to year of 2007.

(5) Current situation and problem of vessels for aids to navigation services The vessel is one of the indispensable facilities to maintain the normal condition of Aids to Navigation.

Vessel for aids to navigation service has a role of inspection of visual aids to navigation and transportation of goods for keepers.

It is required for operation and maintenance of visual aids to navigation to check

and confirm and repair the lighting equipment and so forth by vessels. These services must be done regularly.

At present, eighty (80) aids to navigation vessels in total are listed on "KAPAL NEGARA KENAVGASIAN" of Directorate General of Sea Communications (DGSC).

Number of vessels, which is actually operated for the supporting services for aids to navigation, is seventy-five (75) because three (3) vessels are under process of scrapping and two (2) vessels are sunken on list.

Now, seventy-five (75) vessels are allocated to each DISNAV/Sub DISNAV and BTKP for the aids to navigation services.

The vessels for aids to navigation services up to year 2020 should be categorized as four (4) kinds vessels that are Buoy Tender, Aids Tender, Inspection Boat and Survey Vessels.

Fifteen (15) vessels for aids to navigation services have been constructed from 1995 by the loan of Japan and Netherlands.

At present, these fifteen (15) vessels are at the age of 0.15 years, seven (7) vessels are 16-25 years, twenty-five (25) vessels are 26-35 years, eight (8) vessels as 36-40 years and twenty (20) vessels are more than 40 years.

Age of vessels for aids to navigation service are as shown in Table 9.1.13.

Table 9.1.13. Ag	ge of Vessels for	Aids to Navigation	1 Services
------------------	-------------------	--------------------	------------

Vessel's Age	Number of vessels		
0-15 Years	15		
16-25 Years	7		
26-35 Years	25		
36-40 Years	8		
More than 40 Years	20		
Total	75		

The vessels planned by DGSC to be scrapped are 29 vessels, up to the end of 2003.

The numbers of the vessels for aids to navigation service by age and kind are shown in **Table 9.1.14**.

At Present								
Type of Vessels Vessels Age	Buoy Tender Vessel	Aids Tender Vessel	Inspection Boat	Survey Vessel	Total			
0-15 Years		12	3		15			
16-25 Years	3	3		1	7			
26-35 Years	3	15	7		25			
36-40 Years		7	1		8			
More than 40 Years		19	1		20			
Total	6	56	12	1	75			
Scrapping Plan	0	26	3	0	29			
Balance	6	30	9	1	46			

Table 9.1.14. Number of the Vessels for the Aids to Navigation Servicesby Age and Type

The numbers of Aids Tender Vessels are including Supply Vessels.

The number of vessels of over 35 years old is thirty-two (32), and occupies 42.6 % among the operative vessels. Their technical condition is judged as lower than 60 % in average by DGSC.

The technical conditions of vessel are decided by the condition of the hull and its installed equipment.

The condition of each factor indicated by percentage, is deemed to be the vessel's condition. Most important factor is the condition of hull and main engine.

The technical condition of a new vessel is assumed to be 100% Decrease of this figure is judged by the decrease of loading capacity and cruising speed of the vessel, etc..

Detail of present technical condition of vessel is shown in **Appendix 9.1.5**. At present, services for maintenance of ATN are carried out only once or twice in a year. It is not sufficient.

This state comes from the weakness of vessel's condition as a whole. And it is

one of the reasons why the availability of aids to navigation facilities in Indonesia is not able to realize 95%, which is the figure recommended by IALA.

There are many Aids to Navigation facilities that are out of service now. Major reason is of course the shortage of budget for maintenance. It is influencing the maintenance work of vessels such as repairing and docking.

It is confirmed that some problems in vessel for aids to navigation services are found by the inventory, reports of DGSC and site survey.

DGSC is considering that the minimum standard number of vessels required for aids to navigation services is 59, if the technical condition of them is kept at the level higher than 80%.

On the other hand, scrapping of the vessels has been planned for old vessels of low technical condition. This minimum standard number is examined in this study.

The problems are caused by followings:

Aged vessel

According to **Table 9.1.13.**, vessel of over 26 years occupies 70.7% (53 units) of all.

Technical condition of vessel

The result of calculation with the value shown in **Appendix 9.1.5**. indicates the average technical condition of whole vessels is 66.5%.

Vessels whose technical condition is lower than 60% are 48%(36 units), and lower than 80% are 77.3% (58 units).

Technical conditions of a vessel should be always kept higher than 80% to carry out her duty.

Shortage of budget

It is confirmed that the decline of service qualities of vessel activity comes from the shortage of budget, that is,

- Difficulty of procurement of spare parts, fuel oil and so forth
- Delay of regular docking, special docking
- Difficulty of repairing

However, the reason of vessel's old age, average ability of vessel's actual operation is not enough for carrying out the duties.

Estimated actual operation is 10% to 30% for the regular services with machine working and ship operation, on average.

9.1.4. Management and Maintenance Authority Comparison between Japan and U.K.

(1) Management and maintenance authority in U.K.

The aids to navigation services in U.K. are performed by three (3) organizations, which are Trinity House, The Northern Lighthouse Board and The Commissioner of Irish Light.

Three (3) organizations have responsibility for the Aids to Navigation Services as the authority of aids to navigation services in U.K..

The responsible area of aids to navigation services for each authority is as follows;

Trinity House

Trinity House constituted under a Royal Charter granted by Henry VIII in 1514 is responsible for "England", "Wales" and "The Channel Islands and Gibraltar".

The Northern Lighthouse Board The Northern Lighthouse Board created by Act of Parliament in 1786 is responsible for "Scotland" and "The Isle of Man".

The Commissioner of Irish Light The Commissioner of Irish Light founded in 1867 is responsible for "Eire" and "Northern Ireland".

The three authorities compose the General Lighthouse Authority for the United Kingdom and Ireland.

Each authority performs on the whole aids to navigation services to mariners and related organizations, in his responsible area. At the international conference such as IALA, they attend to the conference

as the national member of IALA from three authorities each other.

They have facilities on aids to navigation services such as buoy tenders, helicopters, training schools, laboratories and so forth, of course lighthouse, light buoys to be served to mariners independently.

The running costs required for the management and maintenance are met from a "General Lighthouse Fund", financed by the collection of Light Dues paid by commercial ships calling at British and Irish ports, and by fishing vessels over 10m in length.

The fund, administered by the Department of Environment, Transport and the Regions, is entirely self-financing, and receives no grant from the Exchequer.

The Commissioner of Irish Light can additionally receive a grant in aid made through the General Lighthouse Authority by the Irish Government's Department of the Marine and National Resources.

Trinity House works, on behalf of the three General Lighthouse Authorities for the United Kingdom and Ireland, to develop and evaluate the navigation technology of tomorrow.

Also, Trinity House inspects aids to navigation provided by local port and harbor authorities.

(2) Management and maintenance authority in Japan

On the other hand, the aids to navigation services are fully performed by the Japan Coast Guard as authorities of aids to navigation services.

Whole running costs for the activities on aids to navigation services performed by the Japan Coast Guard are obtained from the national revenues.

9.2. Telecommunications System

Maritime telecommunication services to be provided by DGSC were defined by Indonesian Telecommunication Law No3/1989 as follows:

- Special task on search and rescue, navigation and meteorology and geophysics
- Basic telecommunication service on public communication between land and ship which is to be provided under joint operation agreement with PT. TELKOM

And as already discussed in Chapter 3, the telecommunication means should follow various international conventions and regulations.

The 221 coastal radio stations (except for Dili) are listed at present. Available services by each classified station are as shown in **Table 9.2.1**. in principle.

			Availability by stations c			s class
No.	Type of Service	Descriptions	1 s t	2 n d	3 r d	41 th
1	Directional	500kHz signal	\checkmark			
	Finding (DF)	2,182kHz signal	\checkmark			
2	MF TG services	500kHz TG	\checkmark	✓	✓	
		518kHz NAVTEX (4 stations)	\checkmark			
		DSC/NBDP	\checkmark	\checkmark	\checkmark	(√**)
3	MF TP services	2,182kHz Telephony	✓	✓	\checkmark	(√**)
4	HF TG services	DSC/NBDP	✓	\checkmark	\checkmark	(√**)
5	HF TP services	Telephony.	✓	\checkmark	\checkmark	(√**)
6	VHF TG services	Ch70 DSC	✓	\checkmark	\checkmark	(√**)
7	VHF TP services	Ch16 Telephony	\checkmark	\checkmark	\checkmark	(√**)
8	Internal comm.	Point to point telephony &	\checkmark	\checkmark	√*	√ *
	(fixed) services	ARQ telex.	\checkmark	\checkmark	√ *	√ *

 Table 9.2.1. Currently Available Services by Station Class

Note GMDSS consists of the above services except for those written in *Italic character*.

* : This service is available by using mobile equipment alternately.

**: Station where currently classified as 4^h, but already furnishes GMDSS equipment, is required to be upgraded its classification as the 3rd.

Summary of the stations such as number of personnel, operation hours, GMDSS or not, and operational emergency frequencies are shown in **Appendix 9.2.1**.

9.2.1. GMDSS

Stations where GMDSS is already introduced and their service areas are illustrated in **Figure 9.2.1**.

However there are some blind zones around the shores of Indian Ocean, Banda Sea and Arafura Sea. There should be covered by appropriate timing.

Figure 9.2.1. GMDSS Coverage A rea (at Present)



Remarks: A3 area is covered by Belawan, Dumai, Jakarta, Surabaya, Makassar, Bitung, Ambon, Jayapura, Semarang, Kupang, Balikpapan and Sorong.

9-2-2

NAVTEX broadcasting service is provided by the 5kW transmitter of Jakarta and 1kW transmitter of Makassar, Ambon* and Jayapura*.

N.B.: Two *marked stations do not send the signals since the equipments have been in trouble and the repairing is difficult due to recent political unrest.

Each NAVTEX station transmits navigational information at pre-fixed time coordinated by IMO/IHO because the NAVTEX service in international language (English) is executed by one frequency 518 kHz only over the world. The time schedule for world NAVTEX systems and the allocated times to the Indonesian NAVTEXs are as shown in **Table 9.2.2**.



Table 9.2.2. NAVTEX Transmission Schedule

Figure 9.2.2. shows coverage areas of each NAVTEX. Actual field strength in the area has been measured and confirmed as sufficient at the time of the Study on Strengthening Maritime Telecommunication System in 1997.

The northern part of Sumatra is not covered by Indonesian NAVTEX. The service in this area has been provided by coast stations in Singapore and Malaysia based on an agreement of NAVAREA-XI Coordination Meeting.

As the results, more NAVTEX expansion or transmitter's power-up is not required.



Figure 9.2.2. NAVTEX Coverage Area (at Present)

9.2.2. Internal Communication System

Regional office's communication systems including SAR communication system are much confused due to lack of maintenance and operation personnel, shortage of budget, decentralization of central government's functions to local governments and reshuffling of tasks among the Ministry of Communications. As the results most of hardware becomes out of order.

While the fixed communication system between coast stations is well maintained.

Beside the above, for internal communication, more accurate and stable system is required to ensure the communications among the offices. Therefore this internal communication system should be reviewed and re-established by appropriate and state-of-the art technologies.

9.2.3. Public Communication System

Figure 9.2.3. shows historical traffic volumes at Jakarta station for example.



Figure 9.2.3. Traffic Volumes at Jakarta Station

The traffic decreases drastically from 1990s. This phenomenon occurs due to a shift of public telegraph/telephone traffic to satellite or land mobile phone system. This fact, decrement of traffic, should be considered when the coast stations are designed in future.

In the passed era, HF system was only the economical system for public communication between land and ship. However more convenient and cheaper system arose in this communication field now.

Reflecting the development of telecommunication systems and the actual situations stated above, the Indonesian Telecommunications Law was revised in 1999 (Law No. 36). And this public telecommunication services at offshore was opened to any operator who desires to provide the services.

This means, DGSC has lost the monopolized right to provide the public telecommunication services but has been released from the duty of the provision of the services too.

From the above facts, more expansion or reinforcement of the facilities/ equipment for public telecommunication services will not be required.
9.3. Search and Rescue System

9.3.1. Organization of Search and Rescue

Search and Rescue (SAR) activities in Indonesia are performed under the coordinating umbrella of the National Search and Rescue Agency (BASARNAS). Coordination affairs among all of the SAR organization are conducted by BASARNAS of central government. Regarding a regional SAR activity, it is coordinated by Rescue Coordination Center (KKR) and Rescue Coordination Sub-Center (SKR) that are subordinate bodies of BASARNAS.

On the other hand, DGSC is responsible for execution of SAR activities that are conducted under the coordination of BASARNAS. Furthermore, the Directorate of Guard and Rescue (GAMAT) carries out SAR tasks with its operation units.

The Directorate of Navigation and Marine Safety provides support for the GAMAT operations with the operation units of Districts of Navigation (DISNAV) and Harbor Masters (ADPEL) .

BASARNAS is also authorized to request the dispatch of units to Marine Police, Navy, Air Force in case of necessity and to coordinate all of SAR organizations during SAR operation.

9.3.2. Organization Regarding Search and Rescue

(1) BASARNAS

BASARNAS is the coordinating organization of SAR operation regarding land disasters, marine casualties and aircraft accidents, and BASARNAS has KKR or SKR in each province as its branch organization.

BASARNAS has only five (5) small rescue boats (type of 12 meters), and 10 small helicopters for SAR activities. Although it has 10 helicopters, seven (7) of them are operated by Navy and three (3) of them are operated by Air Force.

(2) GAMAT

GAMAT has the primary responsibility for the execution of maritime SAR activities in Indonesia. It has 42 local units in the whole country, and has a total of 107 patrol vessels of Class type and below belonging to the local units. It also has GAMAT Fleet as the unit under the direct control of GAMAT Headquarters. GAMAT Fleet has its headquarters in Jakarta (Armada) and three(3) local bases in Ambon, Surabaya and Tanjung Uban, and 22 patrol vessels of Class type and below. The largest type patrol vessel at present in GAMAT is Class type that has an overall length of 40m. There are nine (9) Class type vessels on the register, all of which are intensively stationed at GAMAT Fleet Base of Armada. GAMAT has no Class type patrol vessel

until now. GAMAT doesn't have any aircraft for the SAR activities. GAMAT patrol vessels are divided into five (5) classes as shown in **Table 9.3.1**.

CLASS	SUMMARY
Class	The full length over 50m (This class has not existed until now.)
Class	The full length over 40m less than 50m
Class	The full length over 30m less than 40m
Class	The full length over 20m less than 30m
Class	The full length over 10m less than 20m

Table 9.3.1. Classification of GAMAT Patrol Vessel

Source: GAMAT

The stationing of patrol vessels of GAMAT are as mentioned in **Table 9.3.2**. Seeing the stationing of patrol vessels of GAMAT Fleet, it can be said that the emphasis is placed on Java Riau sea area.

Local Unit	Ν	Number of ve	ssels (Class	distinction)	
Local Unit	Class Class		Class	Class	Total	
Ambon				3	3	
(GAMAT Fleet)		2			2	
Barikpapan			1	1	2	
Banda Aceh				1	1	
(Uleleu)				1	1	
(Malaha)			1		1	
Banjarmasin			2		2	
Belawan			2	2	4	
Bengkulu				1	1	
Benoa				2	2	
Biak				1	1	
Bitung			2	2	4	
Cilacap			1	2	3	
Cirebon			1	2	3	

Table 9.3.2. Stationing of Patrol Vessels of GAMAT (Year 2000)

Table 9.3.2. Continuation

Local Unit		Number of vessels (Class distinction)								
Local Unit	Class	Class	Class	Class	Total					
Dumai				5	5					
Fak-fak			1	1	2					
Jakarta/Armada (GAMAT Fleet)	9				9					
Jambi			1	3	4					
Jayapura			1	1	2					
Kupang				1	1					
Lembar			1	1	2					
Manado				1	1					
Manokwari			1		1					
Merak			1	1	2					
Merauke		1		1	2					
Pakanbaru				1	1					
Pelambang			2	1	3					
Pangkalan Susu				1	1					
Panjang			1	1	2					
Pantoloan			1		1					
Pontianak		3		2	5					
Samarinda		1	1		2					
Sampit			1	1	2					
Semarang			1	1	2					
Sibolga		1		1	2					
Sorong		1			1					
Sunda Kelapa		1	2	1	4					
Surabaya			3	2	5					
(GAMAT Fleet)		1			1					
Tanjung Pinang			2	3	5					
Tanjung Priok		1	3	2	6					
Tanjung Uban (Gamat Fleet)		1	2	7	10					
Teluk Bayur			1	3	4					

Local Unit	Number of vessels (Class distinction)								
Local Ollit	Class	Class	Class	Class	Total				
Temate				2	2				
Tg.Balai Asahan				2	2				
Ujung Pandang		1	2	4	7				
Total	9	14	38	68	129				

Table 9.3.2. Continuation

Source: GAMAT

The Areas of operational responsibility of GAMAT local units are not always clear, but in general, they are limited within the port areas and to the outer buoy areas where each unit are located. The all sea areas out of the above areas are controlled by GAMAT Headquarters, and the patrol vessels belonging GAMAT Fleet are responsible for SAR activities in the sea areas.

GAMAT always sends two(2) Class type patrol vessels among nine(9) belonging to Base Armada of GAMAT Fleet to the sea areas such as the Straits of Malacca and Singapore, Kalimantan, Surabaya and so on for the patrol. In addition, one(1) Class type patrol vessel is always ready for SAR operation at Base Armada.

(3) NAVIGASI

NAVIGASI has 24 District Navigation Offices, and has survey vessels, inspection boats, buoy tenders etc.; a total of 75 vessels for operation and maintenance of coastal radio stations and aids to navigation. The largest type ship in NAVIGASI is the survey vessel whose full length is 67m. Needless to say, the main duties of these NAVIGASI vessels are not SAR activities, but they will perform SAR activities at the request of BASARNAS as the SAR coordination body or by order of NAVIGASI headquarters.

NAVIGASI has the jurisdiction over coastal radio stations. The telecommunication between land and ship is performed through these coastal radio stations. The information of marine casualties obtained by the coastal radio station is transmitted to the headquarters and or a local unit of BASARNAS directly through a NAVIGASI local unit. NAVIGASI plays an important role in SAR activities with the telecommunication system.

(4) Marine and Aviation Police

The main objective of the Marine and Aviation Police is enforcement of laws and

ordinances at sea, and it is an organization under the Indonesian National Police.

The Indonesian National Police was separated from Indonesian National Armed Forces by the Presidential Decree issued in 2000. The Indonesian National Police has been a genuine police organization since then.

The Marine and Aviation Police has regional headquarters in all the 27 provinces of Indonesia, and also has 70 Office Units and 150 Stations all over the country. The Marine and Aviation Police has 306 patrol vessels for the enforcement of its duties at sea. Among the patrol vessels, the largest type is the class A whose full length is 48m. The Marine and Aviation Police has nine (9) class A type patrol vessels, but over 90% of its patrol vessels are the type of class C whose full length is less than 12m.

And the Marine and Aviation Police has also 19 aircraft (15 helicopters and four (4) airplanes).

(5) Navy

The Navy has two (2) Fleet Commands. One is the Western Fleet Command in Tg. Priok, and the other is the Eastern Fleet Command in Surabaya. Each Command operates the vessels of the Fleet by order of the central organization. The Indonesian Navy has about 260 vessels (only surface ships including Naval Auxiliary Service), and about 90 aircraft all over the country. (Source: Jane's FIGHTING SHIPS 1998 - 99)

In the case of a large scale marine accident that needs big SAR powers, such as an accident that takes place in open sea and is difficult for SAR powers of GAMAT to respond, the Navy dispatches as its own SAR powers at the request of BASARNAS.

The Western Fleet Command has jurisdiction over west of 109th latitude lane in Indonesian sea area, and the Eastern Fleet Command has jurisdiction over east of 109th latitude lane in Indonesian sea area.

(6) Non-governmental SAR Organization

There are no civilian voluntary SAR organizations in Indonesia.

9.3.3. Problems Related to SAR System in Indonesia

(1) Absence of SAR Coordination Function

It is the task of BASARNAS to coordinate SAR activities. Presently BASARNAS does not have sufficient powers to carry out SAR activities. Therefore BASARNAS is now existing only as SAR coordination body without own SAR activities.

BASARNAS sends marine accidents information obtained and requests dispatch of vessels or aircraft to GAMAT and other SAR organizations. But, it is not said that BASARNAS sufficiently achieve the role of command and coordination among the SAR units during SAR activities. Therefore it is estimated that SAR activities are actually carried out without any instructions from BASARNAS. As a matter of fact, each organization carries out SAR operation independently.

Thinking that each SAR organization (DGSC, Marine Police, Navy, etc.) has considerable powers at sea, and in addition other organizations (Air force, Customs etc.) have the powers that can be used for SAR activities, it is necessary that to keep close relationships among these organizations for SAR activities. SAR activities will become more efficient and effective when they are carried out under the cooperation of these SAR powers.

(2) Insufficiency of GAMAT SAR Power

GAMAT has 129 patrol vessels because it is primarily responsible for maritime SAR activities in Indonesia. Considering the large sea area of Indonesian, the number of patrol vessels is very small. Moreover, most of the patrol vessels are under the class type and can be used only in port area and adjacent coastal area.

Considering that the vast offshore area of Indonesian sea is covered by only nine(9) class type patrol vessels, the powers of GAMAT for SAR activities are far from sufficient.

It makes SAR activities more inefficient that GAMAT has no aircraft that has an excellent search ability compared with vessel.

According to the SAR master plan in "The Study on Maritime Safety Plan Concerning Search and Rescue" issued in 1989, until the target year of 2005, it was planned that GAMAT would build a total of 41 patrol vessels afresh including six (6) class -A type patrol vessels (1,000 GT class) and five (5) class

-B type patrol vessels ($500\ {\rm GT}\ {\rm class}$) and establish a total of 164 patrol vessel system.

In addition, GAMAT would procure four (4) airplanes and 12 helicopters and establishes a total of 16 aircraft system as shown in **Table 9.3.3**.and **Table 9.3.4**.

C1	Total No.	Existing No.	Balance	Scrapping	Balance to be
UTASS	(A)	(B)	(A)-(B)	by 2005	replaced
I-A	6	0	6	0	6
I-B	5	0	5	0	5
II	21	9	12	0	12
III	33	16	17	5	22
IV	37	33	4	0	4
v	62	65	Δ3	3	-
Tota1	164	123	41	8	49

 Table 9.3.3.
 Improvement Plan of Maritime Safety Rescue Ships

(The Study on Maritime Safety Plan Concerning Search and Rescue Feb. 1989)

 Table 9.3.4.
 Number and Allocation of Aircraft

(The Study on Maritime Safety Plan Concerning Search and Rescue Feb. 1989)

Туре	KAN- WIL	DGSC Air Station	Airport	No. of Air- craft
Air-	III	Jakarta	Jakarta	2
plane	VI	Ujung Pandang	Ujung Pandang	2
975) 1970 - 1970 - 1970 - 197	Sub :	Total		4
Helic-	I	Medan	Medan	2
opter	II	Tg.Uban	Tg.Uban	2
	III	Jakarta	Jakarta	2
	IV	Surabaya	Surabaya	2
	VI	Ujung	Ujung	
		Pandang	Pandang	2
	VIII	Ambon	Ambon	2
-	Sub 2	fotal		12
	Tota	l .		16

For various reasons, however, only 12 patrol vessels were built after the master plan was drawn up, and introduction of aircraft is not realized as of 2001. The delay of implementation of the master plan resulted in the terrible insufficiency of the capability of GAMAT in SAR operation.

In addition to the above insufficiency, patrol vessels of GAMAT are aged as shown in **Table 9.3.5**.

To make matters worse, terrible low operation ratio resulting from a shortage of

fuel and repair parts and poor maintenance has caused further insufficiency of GAMAT SAR powers. The actual ratio of operation of the patrol vessels is estimated less than 30% of the planning ratio.

On the other hand, thinking about various kinds of rescue activities such as searching, towing, fire fighting, draining and watching, the present models and performances of patrol vessels are not suitable for SAR operation. It is necessary to introduce multipurpose patrol vessels in future.

In order to carry out SAR activities more efficiently, it is necessary to make overall review of the responsible area of each local office, operational demarcations of the patrol vessels of GAMAT Fleet and local units, proper forces of SAR fleet / patrol vessels, performance of patrol vessels, etc.

(3) Insufficiency of Basic Data for drawing up the Measures for Preventing Marine Casualties

In order to draw up proper measures for preventing marine casualties, it is indispensable to grasp maritime traffic conditions of main Sea Lines, narrow channels and other important sea areas by carrying out periodical marine traffic density survey, to investigate causes of marine casualties and to analyze their trend by the statistics of marine casualties.

However, in Indonesia, marine traffic density survey has never been carried out by any authorities as of December 2001.

DGSC is responsible for marine casualty survey, but it has not collected all necessary data concerning all marine casualties because its reporting system to headquarters has not yet been established.

A SAR organization which implements surveys regarding marine accidents reports the survey data to the head of the organization having no relation with other SAR organizations. Furthermore, the items of marine casualty survey are not proper to analyze the causes of marine casualties.

(4) Insufficiency of Data for Improving SAR Activities

For the purpose of improving SAR activities, it is essential to evaluate each activity on whether it is suitable or not by precisely recording the past SAR activities for the future improvement. Without such kinds of activity records, the evaluation of each SAR activity is difficult to do.

Age of ship	39	37	31	26	25	24	23	22	21	20	Subtotal of over 20 years
Class										4	4
Class	1	3						5	4		13
Class					1	5	6	5	5	2	24
Class			1	2	2	8		1	40		54
Total	1	3	1	2	3	13	6	11	49	6	95

Table 9.3.5.Distribution of Age of Patrol Vessels in GAMAT (Year 2001)

Age of ship	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Subtotal of under 20 years	Total
Class	5																			5	9
Class	1			1												1				3	16
Class	2	1		3							1	1		2	3			1		13	38
Class	3	4	2				1									1		1		12	66
Total	11	5	2	4			1				1	1		2	3	2		2		33	129

Source: GAMAT

9.4. Education and Training System

9.4.1. Current Situation (Maritime Telecommunication System)

(1) Methods of Study

During 1st and 2nd Work in Indonesia, the Study Team visited 21 coastal radio stations (some of them were visited twice for confirmation and more detailed study) and related organizations of DGSC and made site survey. Taking these opportunities, the Study Team asked their chiefs and staff for comments or requests about current situations of education and training. This study has been made mainly based on them. In addition, written questionnaires were sent to coastal radio stations for detailed information on training along with other information.

(2) Current Situation of Coastal Radio Stations

The total number of staff working for coastal radio stations is about 960. (According to Ministerial Decree 16/1999)

As for the quality of staff, there seemed to be remarkable differences among persons as well as among stations.

As for persons, quality means the level of knowledge, skill, attitude, etc., and as for stations, it means efficiency of the organization in addition to the quality of staff.

What must be done and easily can be done have not been done at most coastal stations; for example; clocks are not adjusted with more than five-minutes' delay or advance; equipment, facilities and surroundings are not kept in order. These are questions of basic education of attitude.

So far as stations the study team had visited concerned, they did not seem busy. TV sets were kept on and some were playing games.

Manuals for carrying out duties of individual stations are not provided.

Systematic training has not been held for years mainly due to the shortage of budget.

A silver expert has given training for maintenance to technicians at coastal radio stations since 2000.

(3) Requests on Training at Coastal Radio Stations

Requests in common are as follows:

Establishment of systematic training in terms of organization and training staff;

Training at manufacturers;

Training in Jakarta by experts including those from manufactures;

Training for all local technicians of coastal radio stations by visiting experts;

Technical training is necessary also for operators. They themselves will be able to solve some problems while they are on duty, especially at night or on holidays.

(4) Special Matters found during Survey

Not many but some technicians are excellent in their knowledge and skill and also have rich experiences. In addition they are not only creative and aggressive in carrying out their job but also are very good instructors for other staff. Even under the circumstances with shortage of spare parts, budget, etc., there are remarkable differences between a coastal radio station with such person and one without.

There are other type of technicians who have obtained technical knowledge and skill through various kinds of training, domestic and abroad. But they do not want to disseminate the knowledge and skill to the other people. The purpose of international technical cooperation is not only to train a specific person, but also to have him disseminate the technical knowledge and skill obtained through the training to as many people as possible. They can be good instructors in OJT.

9.4.2. Current Situation (Aids to Navigation)

(1) The following information as shown in **Table 9.4.1**. and **Table 9.4.2**. is obtained from the Report on the Preparatory Study in December 2000: (The Study Team confirmed the data at DGSC and learned that there are basically no changes as of November 7th, 2001.)

Kind of Job	Number	Remarks					
Technician	1,264	Mainly work for DGSC Headquarters and					
		District Navigation Offices					
Aids to Navigation	725	Staff for operation and maintenance at					
Staff		aids to navigation					
Vessel Crew	1,435	Those who are on board aids to navigation					
		vessels					

Table 9.4.1. Number of Staff Engaged in Aids to N avigationas of 2000

Name of Course	Period	Remarks
Maritime Aids to Navigation,	2 months	Once a year; mainly on operation
Basic Level		and maintenance of visual aids to
		navigation
Maritime Aids to Navigation,	2 month	Twice a year; mainly on operation
Senior Level		and maintenance of visual aids to
		navigation

Table 9.4.2. Training Courses

Note 1: Senior Level Training has not been held recently due to the shortage of budget.

Note 2: Above training is given at the facility of the Education and Training Agency.

(2) Other Information

As there are few skilled technicians, it is said, when equipment at medium wave beacon stations and solar generated lighted buoys get in trouble, they sometimes ask staff of coastal radio stations to take care of it. It is recognized in general that they are weak in electronic field.

There are training courses for visual aids to navigation, but no such course for radio aids to navigation and they recognize the necessity of such training.

Manuals specific for individual aids to navigation are not provided.

(3) Following is the information on Aids to Navigation through discussion with the Chief and a staff in charge at DISNAV Surabaya:

Number of ATN under the DISNAV (within the Port of Surabaya)

Lighthouses	19 (2)
Lighted beacons	39 (5)
Lighted buoys	26 (26) (all with solar cells)
Unlighted buoys	14 (14)

Personnel and QualificationNumber of personnel102Technicians6Assistant technicians26(Based on the DGSC standards)

Required Training

Training is required for equipment using electronics. They seemed to be

weak in this field. Sometimes technicians from Surabaya Coastal Radio Station fix troubles of aids to navigation. Not vice versa. As for the methods of training, training by visiting experts at the site is the best, they said.

Personnel Exchange

No personnel exchange has taken place between aids to navigation section and telecommunication section but sometimes between ship's radio operators and staff at coastal radio stations.

OJT

OJT opportunities are given at the shift of staff staying at lighthouses.

(4) Group Training by JICA

Group Training "Aids to Navigation Course" hosted by JICA has been held annually for about 30 years. Mostly every year, one person has participated in the course from Indonesia. The training period is about two months.

The training has been given at facilities of Japan Coast Guard such as JCG Headquarters, JCG education and training facilities, a Traffic Advisory Service Center and other aids to navigation offices. Training has been also given at equipment manufacturers.

9.4.3. Organization for Education and Training

An integrated education and training organization in MOC is the Education and Training Agency. The Agency is responsible for education and training in the fields of Maritime, Land, Air Communication and Meteorology.

(1) History of the Education and Training Agency

The Education and Training Agency was founded based on the Ministry of Communications Decree No. 91 in October 1980 in accordance with the Presidential Decree No.47 in 1979. It was established for the purpose of making education and training in MOC integrated and efficient system.

- (2) Organization of the Education and Training Agency The organization of the Agency is as shown in **Figure 9.4.1**.
- (3) Maritime Education and Training CenterOrganization of the Maritime Education and Training Center is as shown inFigure 9.4.2.

The main services under the responsibility of the Center are as follows: Planning education and training for seafarers;

Making curricula and improvement of facilities and materials;

Guidance and supervision of national and private education and training facilities for seafarers;

Evaluation and coordination of seafarer's education and training.

The education and training facilities managed by the Maritime Education and Training Center are as follows:

Maritime Education and Training Institute, Jakarta

This is the typical education facility for officer training in Indonesia. It has Navigation Course and Engineering Course for ocean-going ships' officers. In addition it has Shipping Management Course.

Recently it has become capable of having Master and Doctor Courses. These courses are not only for seafarers but also for those who work for a wide variety of shipping industries.

Merchant Marine Polytechnics; Semarang and Makassar These two Polytechnics has Navigation Course and Engineering Course for ocean-going ships' officers. In addition they have Shipping Management Courses.

Rating and Vocational Schools; Surabaya and Barombong These are facilities for training crewmen for navigation and engineering and also for training navigation and engineering officers for inter-island ships.

Seafarers Education, Refreshing and Upgrading Institute, Jakarta This is the re-education facility for seafarers to get upper grade certificates. It also gives various technological training necessary for seafarers.

Stepping and Skill Training Course for Sea Communication Employee The Maritime Education and Training Center is mainly responsible for the education and training of seafarers. It also has the Stepping and Skill Training Course for Sea Communication Employees, which is in charge of education and training of DGSC employees. The Center plans, implements and evaluates education and training of the courses in (4).

Figure 9.4.1. Organization of Education and Training Agency





Figure 9.4.2. Organization of Maritime Education and Training Center

(4) Stepping and Skill Training Courses for Sea Communication Employees are as shown in **Table 9.4.3**. However, only two courses were implemented in each of the Year 2000 and 2001 for 30 persons in each course.

Course No	Nome of Course	Records	(Persons)
Course No.	Name of Course	Year 2000	Year 2001
	Education and Training for Marine Inspector Type "A"		
	Education and Training for Marine Inspector Type "B"	30	30
	Education and Training for Harbor Master Class "A"		
	Education and Training for Harbor Master Class "B"	30	
	Education and Training for Basic Navigational Aid Equipment		30
	Education and Training for High-Grade Navigational Aid Equipment		
	Education and Training for Basic Pollution Prevention		
	Education and Training for Integrated Technology of Basic Marine Transportation		
	Education and Training for Integrated Technology of Middle Marine Transportation		
	Education and Training for Shipbuilding		
	Education and Training for Ship Registration		

Table 9.4.3. Stepping and Skill Training Coursesfor Sea Communication Employees

Note: Training period for each course is two ~three months.

9.4.4. Evaluation of Current Education and Training System

(1) General

In carrying out duties, it does not seem in general that they have clear sense of purpose personally and organizationally.

When there are problems with their jobs, they are liable to attribute them to the shortage of budget, lack of spare parts. It is true in most cases but they do not make possible efforts to improve them.

Above two items are questions of basic education of attitude.

It does not seem that there is established vision of education and training, especially in long term.

Judging from the current situation, it will take pretty long time to train those to be engaged in proposed new international systems.

In connection with the above, the number of staff with good command of English is far from sufficient.

Proper education and training will improve current poor management and maintenance situation in addition to the procurement of equipment and spare parts.

On-the-job training (OJT) is very important and leaders recognize it but actually it is not given systematically.

(2) Education and Training Agency

So far the study team have contacted with information sources about the Education and Training Center of MOC, but there are many unknown factors, especially professional training in the field of aids to navigation and maritime telecommunication system.

It is supposed that any kinds of integrated education and training system will be planned, implemented and evaluated by the Agency. However, DGSC side will examine training needs and make original concrete plans. It is necessary for planning integrated education and training system to make clear the roles of both organizations.

The Agency is the integrated organization for the education and training of all the MOC related personnel. So far as maritime affairs concerned, however, it seems that emphasis is placed too much on seafarers' education. It is understandable from historical points of view and others but in the near future, it will be necessary to meet growing demands for the internationalization and new technologies in various fields of MOC. (3) Maritime Telecommunication System

The study team learned that the training given by the silver expert was very useful and popular among trainees at every coastal radio station they visited. It is desired the system will continue and stations to visit will increase in number.

As mentioned in 9.4.1.(4), quality of leaders give big influence on the staff and the organization. It is necessary to train not only to develop maintenance and operational knowledge and skill but also to improve attitude to carry out job.

The chief of every station says, "We have no problem with operation but many problems with maintenance" but it is necessary and difficult to obtain operational ability to cope with the new systems of international nature.

It is necessary to make a manual specific for each station. It is useful for self-training and OJT.

(4) Aids to Navigation

In general, they have few problems with traditional visual aids to navigation but many problems with electronic aids to navigation. To meet the requirements of proposed new systems, they have to get training in electronic field. The training must be given well in advance of the start of such facilities.

As in the above (3) , a specific manual for each facility should be made.

The Group Training for Aids to Navigation hosted by JICA has taken place for about 30 years. It is necessary to make study to meet the new requirements of new systems such as DGPS and VTS.

There are a lot of unknown factors in the training needs for aids to navigation. It is necessary to make more detailed study.

APPENDICES

	Average	Т	emper	ratures		Averag	e	Avera	ge	Precipi	tation				V	Vind d	istribu	tion-P	ercenta	age of o	bserva	tion fro	m							Mea	n wind			
	Pressure	Mean	Mean	Mean	Mean	humidi	ty	cloud		Aver-	No. of		r	1		700			1				1		1300			1		spee	d	Num	ber of	days with
Month	at MSL	daily	daily	highes	t lowest		1000	cover	1000	agel	days with			_	aP								-	aF					a 1	-	1000			
		max	min.	in each	in each	700	1300	700	1300	fall	0.3mm.	N	NE	Е	SE	S	SW	w	NW	Calm	N	NE	Е	SE	S	SW	w	NW	Calm	700	1300	Gale	fog	Thunder
	mb			montin	montin	9	6	Ok	tas	mm	or more					1														K	nots			
January	1010	29	23	32	2 22	92	73	3 7	7	381	20	6	4	4	5	8	11	14	6	42	18	3	2	1	2	7	24	42	1	2	6	0	5	10
-																																		
February	1010	30	23	33	3 21	93	72	2 7	7	302	18	5	2	3	7	10	11	10	5	47	18	4	2	1	2	5	28	39	1	2	6	0	2	12
March	1000	21	2/	39	2 99	03	60	6	7	240	16	4	2	4	6	6	10	0	2	56	10	19	2	9	1	6	26	20	9	9	6	0	4	19
March	1005	, 51	24	. 30	5 66	33	03	, 0		240	10	4	~	-1	0	0	10	3	5	50	13	12	5	~	1	0	20	23	~	~	0	0	4	15
April	1009	32	24	34	4 22	92	66	6 6	6	119	11	2	6	6	9	8	5	4	1	63	28	29	10	2	1	5	14	14	1	1	5	#	5	10
												-					_							_		-	_				_			
Мау	1009	32	24	33	3 22	91	66	6 6	6	113	10	2	10	10	12	7	2	1	1	61	22	39	18	3	1	3	8	8	1	1	5	#	3	10
June	1010	32	24	33	3 22	89	63	6 6	6	94	7	3	8	8	10	7	2	1	1	62	21	34	23	3	1	3	9	9	2	1	6	0	#	5
																															-			
July	1010	32	24	33	3 21	88	58	3 5	5	59	5	4	7	7	13	10	3	2	1	55	20	32	19	4	1	6	8	8	2	1	6	0	2	3
August	1010	39	23	3/	1 91	99	57	5	5	58	5	2	0	0	15	19	2	9	1	50	33	97	12	5	1	3	19	19	1	1	6	0	1	6
August	1010	52	20	5 34	± 21	00	57	5	J	30	5	3	9	9	15	12	3	2	1	50		21	15	5	1	3	12	12	1	1	0	0	1	0
September	1011	33	23	3 4	4 21	87	57	5	5	67	5	3	1	1	12	18	2	2	2	47	45	17	8	7	2	3	15	15	1	1	6	0	1	7
October	1010	33	24	34	4 22	86	60) 5	6	95	8	4	6	6	13	14	5	3	2	50	42	17	6	5	2	4	17	17	1	1	6	0	1	7
November	1009	33	24	34	4 22	91	64	5	6	130	12	4	6	6	9	13	8	5	1	51	33	15	7	4	1	6	19	19	2	2	6	0	3	13
									-					-	-			-	_					-	_	-				-	-	-		
December	1009	32	24	33	3 22	91	68	6 8	6	115	15	5	5	5	7	10	10	14	3	41	22	6	3	1	3	7	32	32	2	2	6	#	2	9
Maana	1010		94	*95	***90	00	64		0			4	e	0	10	10	0	0	9	59	97	90	0		9	F	90	20	1	1	0			
Means	1010	52	24	- 30	5	90	04	E 0	0			4	0	0	10	10	0	0	2	52	21	20	9	3	2	3	20	20	1	1	0			
Totals										1823	131					1																1	29	104
Exteame																																		
values				40	0 18																													
No. of years		+	I	+	1		I	-	L		1		I	I	I	I		1	I	I		I	l	I	I	I	I	I	1		L			
observation	42	2	42	2	42		42	2	42		30									30									30		42	42	12	42
	* - Mea	ın of hiş	ghest	each ye	ar		*** -]	Highes	t recor	ded ter	nperature			# - F	lare																			
	** - Mea	ın of lov	vest ea	ach yea	r		**** -	Lowest	recor	ded ten	nperature			## - A	All obs	ervati	ions																	

Appendix 2.2.1. Monthly Climatic Data (Jakarta)

** - Mean of lowest each year Source : British Admiralty Sailing Directions

	Average		Temp	erature	s	Ave	rage	Avera	ige	Precip	oitation					V	Vind	distri	butio	n-Perc	entag	ge of o	bserv	ation	from	1000				Me	an wir			
Manufla	Pressure	Mean	Mean	Mean	Mean	hum	idity	cloud		Aver-	No. of			1		700										1300				spe	ed	Num	ber of da	ays with
Month	at MSL	dally	dally	nignes	in each	400	1300	cover 700	1300	agei	days with	N	NF	F	SF	S	SW	w	NW	Calm	N	NF	F	SF	S	SW	w	NW	Caln	700	1300	Cale	for	Thunder
		шал		month	month	400	1500	100	1300	lan	or more	1	INE	Е	5Ľ	5	500	**	1 4 4 4	Cam	1	NE	Б	JL	5	500	**	1 1 1 1	Cam	100	1500	Gale	log	munuer
	mb			۰C		Ģ	%	Ok	tas	mm]	Knots			
January	1010	32	25	33	23	92	68	5	6	264	19	#	1	1	1	7	10	51	2	29	19	6	7	#	2	#	50	14	1	3	7	#	#	13
February	1010	32	24	33	23	93	69	5	6	248	17	#	#	1	1	5	8	51	3	31	23	1	6	1	1	1	44	21	2	3	7	#	#	13
	1010	00	0.5			00	00	-	0	001	17				0	10			0	40		10	0.5	0				1.4			0			10
March	1010	32	25	34	24	92	68	5	6	231	17	1	1	8	Z	10	11	Z4	Z	42	23	10	25	3	1	1	22	14	Z	Z	6	#	#	16
April	1010	32	25	34	24	91	65	4	5	157	11	1	1	11	4	12	11	21	1	38	15	12	50	2	1	1	7	10	2	2	7	#	#	13
May	1010	33	24	34	23	90	60	3	4	126	10	#	1	16	3	7	11	18	1	44	4	8	78	5	1	#	1	2	1	2	7	#	#	6
Iune	1011	32	25	33	99	90	59	3	3	41	4	1	1	16	9	11	13	12	#	44	4	9	78	6	1	#	1	2	1	2	7	#	#	3
June	1011	5~	20		~~~	50	00	5	5	- 11	r			10	~	11	10	1~	n	11	r	5	70	0	1	"		~		~	'	"		5
July	1011	32	23	33	21	86	55	3	2	24	3	1	1	12	1	12	11	20	1	41	2	6	81	6	2	0	1	1	#	2	7	#	#	1
August	1012	32	24	33	21	85	50	2	2	11	1	#	#	10	3	13	8	18	1	46	1	3	87	5	2	0	#	#	#	2	8	#	0	1
September	1011	33	24	34	22	85	45	2	2	22	2	2	#	6	3	14	13	24	#	39	1	3	86	4	2	#	1	2	1	2	8	#	#	1
October	1011	34	25	35	23	85	47	2	3	47	5	2	1	5	2	12	11	21	3	43	7	9	74	4	#	1	1	4	1	2	8	#	#	5
November	1010	34	25	35	24	88	56	4	5	154	11	1	#	3	2	11	12	27	2	42	22	13	42	2	1	1	9	9	1	2	7	#	#	13
December	1010	32	25	34	23	89	64	5	6	227	18	1	1	3	1	9	9	40	2	34	26	5	16	1	2	1	33	14	3	3	6	#	#	14
Means	1011	32	25	*37	**20	89	59	3	4			1	1	8	2	10	11	27	1	39	12	7	52	3	1	1	15	8	1	2	7			99
m . 1										1550	110																						لـــــا	
Totals			-				-			1552	118																					#	#	
Externe																																	┝──┤	
values				***39	****19																												1	
No. of years																																		
observation	16				16		16		16		20									16									16		16	16	16	16

Appendix 2.2.2. Monthly Climatic Data (Surabaya / Tanjung Perak)

*** - Highest recorded temperature #-Rare **** - Lowest recorded temperature ##-All observations

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

	Average	Т	'empera	atures		Avera	ıge	Avera	ge	Precipi	tation				Win	d disti	ributio	n-Perc	entage	e of obs	ervatio	on from	1							Mea	n wind			
	Pressure	Mean	Mean	Mean	Mean	humie	dity	cloud		Aver-	No. of					700)								1300					spee	d	Numb	er of da	ys with
Month	at MSL	daily max	daily min.	highest in each	in each	700	1300	cover 700	1300	agel fall	days with 0.3mm.	Ν	NE	Е	SE	s	sw	w	NW	Calm	Ν	NE	Е	SE	s	SW	w	NW	Calm	700	1300	Gale	fog	Thunder
	mh			month	month		<i>y</i>	Ok	toc		or more																			V.	anto			
January	1011	30	24	32	23	96	70	7	tas 7	255	10	5	#	#	#	0	1	7	12	74	32	5	0	1	#	1	5	43	7 0	<u>к</u>	1015 6	#	1	7
Sanuary	1011	50	~1	52	. 20	50	11	'	'	200	15	5	"	'n	"			· ·	16	11	52	5	0	1	'n	1	5			1	0	u.	1	'
February	1010	31	24	33	222	96	69	6	7	265	16	2	1	#	#	0	3	4	6	85	24	4	1	1	#	4	9	44	1 12	1	5	0	1	10
March	1010	32	24	33	22	97	69	6	7	309	18	1	#	#	#	0	2	2	4	91	12	10	3	4	5	4	11	25	5 27	0	4	#	2	13
																														1				
April	1009	32	24	34	23	97	69	6	6	285	16	1	#	1	1	1	4	3	1	87	6	8	4	12	17	7	8	10) 29	1	3	C	2	15
May	1009	32	24	34	23	97	69	5	6	155	12	0	0	#	2	4	3	1	1	89	2	5	8	23	17	6	2	Ę	5 32	0	3	#	3	10
June	1009	32	24	34	23	96	67	5	6	128	9	0	#	1	3	6	1	2	1	86	0	2	6	36	29	6	1	1	20	0	4	#	2	7
Teelee	1010			94		05	64	٣	C	109	~	0	0	1		10		1	0	00	щ	0	19	07		4	9	4	10	1	F	щ	0	F
July	1010	32	23	- 34	- 22	95	04	э	0	102		0	0	1	4	10	4	1	0	80	#	3	12	37	28	4	2	#	13		5	#	2	. 5
August	1011	33	23	34	22	94	60	5	6	86	8	#	0	#	9	10	4	1	0	76	0	1	15	52	21	1	1	() 9	1	5	#	4	5
September	1010	33	23	34	22	95	59	5	6	85	8	#	0	#	4	8	4	2	#	81	1	4	17	36	25	3	4	1	1 10	1	5	0	4	7
0.1	1010					0.5			~		10					<u> </u>						~	L			_							~	10
October	1010	33	23	34	22	95	61	6	7	202	12	1	#	#	1	. 5		2	#	84	3	7	14	23	14	5	6	:	5 24		4	ŭ	7	10
November	1011	32	24	34	23	96	66	7	7	343	16	#	0	C	0	3	9	5	4	80	9	3	4	10	5	10	10	27	7 22	1	4	#	2	14
December	1011	31	24	33	22	96	71	7	7	265	20	2	0	0	1	0	4	9	11	73	13	3	1	2	2	5	14	48	3 14	1	5	#	#	10
Means	1010	32	24	*34	**22	96	66	6	7			1	#	#	2	4	4	3	4	82	9	5	7	13	5	5	6	19	9 18	1	4			
m . 1										0.400	101																							110
Totals										2480	161																					2	30	113
Exteame				<u> </u>									<u> </u>			<u> </u>	-													-				
values				***39	****19																													
N f		<u> </u>			<u> </u>	<u> </u>									I		I	I								I								
observation	42										30									12									12			12	12	12

Appendix 2.2.3. Mothly Climatic Data (Palembang)

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare ## - All obsevations

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

	Average	Г	emper	atures	1	Averag	e	Avera	ge	Precipi	tation					Wind o	distribu	ition			1										Me	an wine			
Month	Pressure at MSI	Mean	Mean	Mean	Mean	humidi	ty	cloud		Aver-	No. of days with					All of	oservat	ions				1		1	1300				-		spe	ed	Num	ber of d	ays with
wonth	at MSL	max	min.	in each	in each	600	1400	600	1400	fall	0.3mm.	Ν	NE	Е	SE	S	SW	W	NW	Calm	Ν	NE	Е	SE	s	SW	V	W N	W	Calm	700	1300	Gale	fog	Thunder
				month	month						or more																							at0700	storm
-	mb			٠c		ç	6	Ok	tas	mm																						Knots			
January	1011	. 29	22	32	2 19	9 94	68	6	5	135	11	5	#	#	5	5	10	45	25	5	5													4	9
February	1010	31	22	33	3 20	94	65	5	5	90	8	5	5	5	5	5	10	35	25	5	5													3	9
March	1010	32	22	33	3 21	l 94	65	6	6	105	9	5	5	5	5	5	10	35	25	5	5													2	16
April	1009	32	23	34	4 21	1 93	65	6	6	130	10	5	5	5	15	10	10	25	15	10)													3	21
Mav	1009	32	23	34	1 25	2 93	64	6	6	160	12	#	#	10	20	20	15	15	10	10														2	20
Juno	1000	20		24	1 91	02	62		6	120				10	10	15	15	20		5														9	15
June	1009	5 32	23	34	± 21	1 93	03		0	130	9	J		10	10	15	15	20	5	3	,													~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	15
July	1009	32	22	34	4 20	93	61	6	6	135	9	5	5	10	10	10	15	20	10	5	i													2	17
August	1009	31	22	34	1 21	l 94	63	6	6	175	13	5	5	10	10	10	15	15	10	10)													2	19
September	1010	31	22	33	3 21	94	66	6	6	210	14	#	#	10	15	15	15	25	15	5	i													1	15
October	1010	30	22	32	2 21	l 95	69	7	6	260	16	5	#	10	10	10	10	25	15	10)													2	18
November	1010	29	22	32	2 21	94	70	7	6	240	17	5	#	5	5	5	5	25	30	5	6													2	16
December	1010	29	22	32	2 20	94	71	6	6	230	15	5	#	#	5	5	10	50	20	5	5													1	13
Means	1010	31	22	*34	**19	94	66	6	6			5	5	5	10	10	10	30	15	5	5						_							<u> </u>	
Totals		1								2000	143																							26	188
Exteame values				***36	****16																														
No. of years observation	40)																																	

Appendix 2.2.4. Monthly Climatic Data (Medan)

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare ## - All obsevations

* - Mean of highest each year ** - Mean of lowest each year Source : British Admiralty Sailing Directions

Appendix 2-2-4

	Average	Г	emper	atures		Avera	ge		Precipi	tation				V	Vind di	stributi	on-Perc	entage	of obse	ervatio	on from								Mea	n wind	1		
	Pressure	Mean	Mean	Mean	Mean	humio	lity		Aver-	No. of					700						_		_	1300			_	_	spee	d	Nur	iber of	days with
Month	at MSL	daily	daily	highest	lowest				agel	days with			_		_							_		_								<u> </u>	
		max	min.	in each	in each	500	1400	1400	fall	1mm.	N	NE	Е	SE	s	SW	w	NW	Calm	N	NE	Е	SE	s	SW	W	NW	Calm	800	1400	Gale	fog	Thunder
	mb			month	month	0	V			or more									-				1						L/	note		<u> </u>	
January	1010		24	· C 39	91	03	0 73	7	248	15	33	7	1	#	#	1	10	23	25	6	10	33	#	19	6		5	10	1	11015	#	#	10
January	1010	51	24	32	~ ~1	. 33	73		240	15	- 55		1	π	π	1	10	20	23	0	10	55	π	12	0	, ,		10	4	· '	π	π	10
February	1010	31	24	33	3 22	92	74	7	217	14	37	8	1	#	1	2	7	24	21	8	11	37	#	10	4	4 5	i 3	5	4	8	#	1	. 8
March	1010	31	24	34	1 23	92	74	6	279	17	35	10	#	#	1	1	11	21	21	5	12	40	#	8	4	1 3	3 3	5	4	8	#	2	11
	1010						~~										10								~					~	<u> </u>	<u> </u>	10
April	1010	31	24	32	2 23	92	75	6	218	14	26	9	2	1	2	3	13	24	20	2	5	33	1	19	7	4	4	4	4	7	#	1	13
Мау	1010	31	25	32	23	92	78	6	258	15	13	2	1	1	5	9	28	24	16	4	2	12	1	39	13	3	3	7	4	7	#	#	10
June	1010	30	25	32	2 23	91	79	6	227	15	9	1	1	1	4	13	40	20	12	3	1	7	1	44	23	1	1	4	5	7	#	#	8
												-	_																				-
July	1010	30	24	33	3 22	89	79	6	269	15	8	#	#	1	6	20	43	9	12	1	#	2	1	51	28	8 1	. 1	5	5	8	#	#	8
August	1011	30	24	31	22	90	78	6	231	12	3	#	#	#	10	27	47	8	4	1	#	#	#	58	28	1	. 1	1	6	9	#	#	7
September	1010	31	25	32	2 22	89	76	6	196	12	8	1	1	#	10	23	38	11	8	1	1	2	#	52	27	1	. 1	3	6	8	#	2	2 7
October	1010	31	25	32	22	90	76	6	194	13	7	2	1	1	6	18	34	18	14	2	2	6	1	44	20) 2	2 2	5	5	7	#	2	2 12
November	1009	31	24	32	2 22	92	75	6	163	13	12	4	1	1	1	7	23	23	28	3	4	1	1	11	11	3	3	7	3	6	#	#	14
								-							_					-	-		-						-	-			
December	1010	31	24	34	1 21	92	74	7	254	17	20	4	2	#	1	4	14	26	27	5	4	1	#	11	11	. 4	4 4	11	3	6	#	#	14
Maana	1010	21	24	*97	***90	01	76	G			10	4	1	1	4	10	96	10	17	2	4	4	1	15	15			6	4	7			
wearts	1010	51	24	-37	20	91	70	0			10	4	1	1	4	10	20	19	17	3	4	4	1	15	15) 3	0	4				
Totals									2754	172			1														1				#	8	122
																															1		
Exteame values				**40	****18																												
No. of years observation	16						16	16		20									16											16	16	16	6 16

- Rare ## - All obsevations

Appendix 2.2.5. Monthly Climatic Data (Balikpapan / Sepinggan)

*** - Highest recorded temperature **** - Lowest recorded temperature

* - Mean of highest each year ** - Mean of lowest each year Source : British Admiralty Sailing Directions

	Average	Т	empera	atures		Aver	age	Averag	ge	Precipit	ation				V	Vind d	istrib	ution-l	Percent	age of o	observ	ation fr	om							Mea	an wind			
	Pressure	Mean	Mean	Mean	Mean	hum	idity	cloud		Aver-	No. of					700			r	r			1	1	1300	1	1	1	r	spe	ed	Num	ber of d	ays with
Month	at MSL	daily	daily	highest	lowest	500	1400	cover	1400	agel	days with	N	NE	F	CE.	c	CW	337	NIM	Colm	N	NE	F	CE	c	CW	147	NUA	Colm	800	1400	Cale	for	Thundon
		max		month	month	500	1400	800	1400	1411	or more	IN	INE	Е	SE	3	310	vv	INVV	Calli	IN	INE	E	SE	3	310	vv	INW	Califi	800	1400	Gale	log	Thunder
	mb			• C			%	Okt	as	mm																				k	nots	1		
January	1010	31	23	33	22	95	71	7	7	372	22	10	17	10	4	2	1	3	2	50	18	7	3	2	7	15	28	8 14	6	2	6	#	#	8
February	1010	31	24	33	23	94	70	7	7	342	20	13	20	10	1	2	1	1	3	50	21	9	3	2	8	11	24	4 18	5 5	2	6	#	#	9
March	1010	32	24	34	23	94	67	7	7	330	20	9	19	11	1	1	1	2	2	55	23	15	4	2	6	9	17	7 10	5 7	2	6	#	1	11
April	1010	32	24	34	23	94	66	6	7	223	16	13	22	10	1	1	2	#	1	50	24	14	8	3	7	8	16	6 15	i 4	2	6	#	1	12
Мау	1010	32	24	34	23	95	66	5	7	200	16	8	18	9	4	1	#	1	#	59	12	11	13	9	10	10	16	6 9	10	2	6	#	1	8
June	1010	32	24	34	22	94	63	5	6	139	13	7	9	9	2	2	#	1	2	67	11	9	19	9	11	8	12	2 9	8	1	6	#	#	4
July	1010	32	23	34	21	95	61	5	6	105	12	3	5	6	3	5	1	1	1	75	7	10	18	12	20	8	e e	9 8	8 7	1	6	#	1	4
August	1011	33	22	35	21	93	55	5	6	104	11	3	4	3	4	5	1	1	1	79	6	9	19	17	20	9	10)	1 5	1	6	#	4	3
September	1011	34	22	35	21	93	53	5	6	152	10	3	6	7	5	3	1	1	1	74	4	9	20	21	18	9	10) :	5	1	7	#	4	3
October	1010	33	23	36	21	92	56	6	7	248	13	7	11	10	3	2	1	1	2	64	7	8	15	13	15	16	14	1 9) 4	2	7	#	4	10
November	1010	32	24	34	22	94	66	6	7	339	19	12	26	7	2	1	1	1	3	47	7	10	7	6	23	14	20) ;	6	3	7	#	1	13
December	1010	31	23	33	22	96	71	7	7		22	12	24	7	2	1	3	3	5	46	13	5	2	2	8	21	32	2 15	6 2	3	6	с	#	9
Means	1010	32	23	*36	**20	94	64	6	7			8	15	8	3	2	1	1	2	60	12	10	8	8	13	12	17	7 1	6	2	6	#		
Totals										2693																					\square	\vdash	17	94
Exteame				***20	****10																													
values	1			30	19																						1				<u> </u>	<u> </u>		
No. of years observation	16			•	16		16		16		20									16				•		•			. 16		16	16	16	16

Appendix 2.2.6. Monthly Climatic Data (Banjarmasin / Syamsudin Noor)

* - Mean of highest each year ** - Mean of lowest each year Source : British Admiralty Sailing Directions

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare ## - All obsevations

Appendix 2-2-6

	Average]	empera	tures		Avera	age	Average	<u>,</u>	Precipita	tion				Wi	nd di	istribu	tion-l	Percent	age o	f obsei	rvation	from							Mea	n wind			
Month	Pressure at MSI	Mean	Mean	Mean	Mean	humi	dity	cloud		Aver-	No. of dows with		1	<u> </u>	r r	800	r r						1	1	1400	r	r	1	1	spee	d	Num	ber of d	ays with
WOITCH	at MSL	max	min.	in each	in each	500	1400	800	1400	fall	1mm.	Ν	NE	Е	SE	S	SW	w	NW	Calm	Ν	NE	Е	SE	s	SW	w	NW	Calm	800	1400	Gale	fog	Thunder
				month	month						or more																						- 8	
	mb			٠C		9	6	Okt	as	mm																				K	nots			
January	1010	30	24	32	2 22	95	76	6	7	666	24	4	7	27	16	2	1	3	2	39	13	1	3	8 3	1	1	24	47	7 7	2	5	#	#	9
February	1010	30	23	33	3 22	96	76	6	7	542	20	2	7	28	20	1	1	4	3	34	14	4	6	2	4	4	22	43	3 3	2	6	#	#	8
March	1010	31	23	33	3 22	94	72	5	6	403	18	2	4	25	24	3	#	1	#	40	8	1	3	2	3	4	38	3 40) 2	2	6	#	#	11
April	1010	32	23	33	3 22	95	70	5	6	219	13	2	2	22	25	4	#	#	0	44	6	3	3	8 1	4	3	40) 34	1 6	1	5	#	#	10
May	1010	32	23	34	4 21	93	67	4	5	143	11	#	2	13	27	6	1	0	#	51	3	6	7	2	1	6	38	33	3 5	1	5	#	#	7
June	1010	32	22	34	1 21	90	63	4	5	73	8	1	1	12	28	5	3	0	#	52	5	7	6	6 4	2	8	43	3 20	0 6	1	5	#	#	2
-																																		
July	1010	32	22	33	3 20	90	60	4	5	62	7	1	1	9	24	8	2	0	1	50	7	8	6	5 2	3	6	45	5 23	3 1	1	6	0	#	1
August	1010	33	21	35	5 19	86	53	3	4	35	4	1	3	15	23	9	1	#	1	47	3	7	7	2	2	4	51	22	2 1	2	7	#	0	1
September	1010	34	22	36	3 19	82	53	3	4	38	4	2	2	10	26	10	4	1	1	48	2	3	2	2 2	2	7	59	23	3 1	1	8	0	#	2
Octobor	1010	34	99	31	5 91	80	57	3	5	110	0	9	1	15	99	8	9	1	#	45	3	1	9	2 2	9	8	65	0 90		1	7	#		
Octobel	1010	51	~~~		, 21	00	57	5	5	115	5	~	1	15	~~	0	~	1	"	45	5	1	-	~ ~	~	0	02		, 2	1	,	n		
November	1009	32	23	34	1 23	91	70	5	6	283	16	2	8	19	19	2	2	1	1	43	5	4	3	4	5	4	39) 34	1 3	2	7	#	#	15
December	1010	30	23	33	3 22	95	77	6	7	564	23	5	8	30	23	1	2	2	2	30	17	4	6	3 3	3	4	23	3 23	3 6	2	5	0	#	11
	1010			*00	**10	0.1	0.0		0					10		-				40	~					~								
Means	1010	32	23	*36	**18	91	66	4	6			2	4	19		5	z	1	1	43	7	4	4	3	3	5	4	3	1 3	<2	6			
Totals										3147	157																					#	#	85
																								1					1					
Exteame																																		
values				***39	****15																													
No of years					1								I											1				1	1					
observation	16				16		16		16		20									16									16		16	16	16	16

Appendix 2.2.7 Monthly Climatic Data (Ujung Pandang / Hasanuddin)

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare

- All obsevations

	Average	Т	emnera	tures		Average	P	Avera	Ide	Precini	tation	1				Wind	distrib	ition-F	Percent	age of (hserv	ation fr	om							Mea	n wind			
	Pressure	Mean	Mean	Mean	Mean	humidit	tv	cloud	50	Aver-	No. of					80	0	10111	creem	uge of t	5556170		0111		1400					spee	ed	Num	ber of	days with
Month	at MSL	daily	daily	highest	lowest		-5	cover		agel	days with						-							1						~ F **	T			j=
		max	min.	in each	in each	500	1400	800	1400	fall	1mm.	Ν	NE	Е	SE	S	SW	w	NW	Calm	Ν	NE	Е	SE	s	SW	w	NW	Calm	800	1400	Gale	fog	Thunder
				month	month						or more																						Ŭ	
	mb			٠C		%	ó	Ok	tas	mm																				K	nots			
January	1011	. 30	22	31	21	97	75	5	6	197	16	2	2 3	3 (6 1	5	2 1	7	2	74	24	13	ę	1	2	3	8 24	14	1 11	1	6	0	#	2
February	1011	. 30	22	31	21	97	75	6	6	190	14	2	e e	6 8	в :	3	2	3	#	76	28	18	ε	1	3	4	16	1 1	l 11	1	6	0	#	3
March	1011	. 30	22	32	20	96	73	5	6	194	15	6	3 7	, ;	8 :	2	1	2	: 1	73	31	23	ę	1	2	2	2 14	Į (9 9	1	7	#	1	ı 3
																																	\square	
April	1010	31	22	32	2 21	96	75	4	6	251	18	2	2 6	6 (6	L	2 2	4	#	78	8 24	14	12	1	6	2	2 14	13	3 13	1	6	#	#	10
May	1010	32	22	33	8 21	96	74	4	6	377	20	2	2 2	2 (6 :	3	4	2	: #	81	15	7	14	5	10	3	8 13	8 15	5 18	1	5	#	#	11
June	1010	32	22	33	20	94	73	4	6	339	18	4	1 2	2 10	D :	5 1	1 #	1	1	67	18	4	10	4	22	4	12	12	2 15	1	5	1	1	1 8
July	1010	32	22	33	8 20	92	69	5	6	337	19	2	2 2	2 9	9 8	3 1	8	1	#	59	19	5	ę	4	26	4	12	2 12	2 12	2	2 6	#	#	6
August	1010	32	22	34	20	88	65	4	5	251	18	2	2 2	2 8	8 1	5 3	0	#	1	43	15	4	12	6	32	2	2 15	5 15	5 6	4	1 7	#	#	4
September	1010	33	21	34	19	93	65	4	6	187	15	1	2	2 10	0 12	2 1	8	1	#	55	21	6	ε	5	17	5	5 19	19	9 7	2	2 6	1	1	ι 5
Ostahan	1010	29		20	20	06	79	4	6	100	14			, ,	7	-	6 #	9	1	74	99		10		10		1.6	14	14	1	5	#	#	11
Octobel	1010	52	66	. 33	20	90	12	4	. 0	190	14	-			· ·	,	0 #	4		/4		. 3	10	9	10	4	. 1.	, 10	0 14	1	. J	#	#	1
November	1010	31	23	33	3 22	97	75	4	7	186	15	2	2 1		5 1	2	5	6	2	2 77	20	6	4	3	5	5	5 16	6 16	6 12	1	5	#	#	12
December	1010	30	23	32	21	96	76	5	7	182	17	2	2 3	3	3 #		2	10	2	74	18	7	3	3	3	7	17	17	7 11	1	5	#	#	6
Means	1010	31	22	*35	**18	95	72	4	6		ļ	2	2 3	3 '	7	5	9	3	1	69	21	9	9	4	11	4	14	14	1 11	1	5	└───	<u> </u>	<u> </u>
																_	_																L	
Totals										2881	199			_	_	_																#	4	<u>, 81</u>
Externe																																├───	┝───	+
values				***38	****15																													
No. of years observation	16	5			16		16		16		20									16	5								16		16	16	16	5 16

Appendix 2.2.8. Monthly Climatic Data (Manado / Sam Ratulangi)

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare ## - All obsevations

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

Appendix 2-2-8

	A	т				A		A	<i>a</i> .	Duestat	tation					Wind	liatuih	stien D		f .	. h. a. a. m	stion fo								Maar				
	Average	Maam	Mage	Magn	Maam	Averag		Averag	ge	Auer	No. of					800	listi ib	ution-F	ercent	age of t	DServa		om		1400					Mean	i winu i	NI	.h	
Month	et MSI	doilu	doilu	highost	lowest	numai	.y	cioud		Aver-	INO. 01		1			800	1	1	r			T	1	r	1400		r		r	speed	1	Nun	ber of	days with
NIOHUH	at MSL	ually	uany	in ooch	in each	500	1400	cover	1400	fell	aays with	N	NE	Б	CE	c	SW	347	NIM	Colm	N	NE	F	CE.	c	CW	34/	NIM	Colm	800	1400	Cal	for	Thundar
		max		month	month	300	1400	000	1400	1411	or more	IN	INE	Е	3E	3	310	vv	INVV	Calli	IN	INE	E	SE	3	31	vv	INVV	Callin	000	1400	Gale	log	Thunder
	mb	1		٠C		9	6	Okt	tas	mm																				Kr	nots			
January	1008	30	24	32	2 22	96	78	6	6	331	18	3	4	3	1	1	4	10	26	48	4	1	2	3	2	12	26	46	4	4	10	#	#	14
February	1008	30	23	31	1 22	97	78	6	6	338	17	3	2	5	1	#	3	11	26	49	4	1	#	3	5	7	29	47	5	4	9	#	#	10
March	1009	31	23	33	3 22	95	71	4	5	166	13	2	7	12	9	2	3	9	11	44	4	2	6	11	6	5	23	39	4	4	9	#	#	7
April	1010	33	24	34	1 22	90	62	2 3	4	75	6	2	8	43	21	#	1	2	3	21	5	6 6	28	21	3	3	9	21	5	6	11	#	#	2
May	1011	33	23	34	1 91	85	56	3	3	14	2	#	8	55	26	2	#	1	1	8	9	· 4	38	28	3	#	10	15	#	q	12	#		#
may	1011		20	0.		00	00		Ŭ		2	"	0	00	20	~		1		Ŭ	_		00	20	0	"	10	10	"	0	12	"		, "
June	1011	33	23	34	4 20	83	54	3	3	15	1	#	8	54	30	2	#	#	#	5	2	2 6	45	27	2	2	7	10	#	10	13	#	#	#
July	1011	32	22	34	1 19	83	51	. 3	3	17	1	#	8	58	27	1	#	#	#	5	2	2 4	41	34	4	1	3	10	2	10	14	#	#	#
August	1012	32	22	34	1 19	81	51	. 2	3	2	1	3	7	61	21	3	#	1	#	4	2	2 3	26	34	3	2	9	21	#	10	14	#	() #
September	1011	33	22	35	5 19	84	53	2	3	4	1	1	15	42	17	1	2	2	5	15	5	6 4	16	22	6	5	11	31	1	7	12	#	() #
Outshare	1010		00	02	7 01	0.0			0	45		0	10	01	10	0			14	07				10	11	~	11	07	1	~	11	"		0
October	1010	34	23	21	21	83	55		3	45	4	3	16	21	10	3	5	6	14	25	5		8	19	11		11	37	1	э	11	#	Ŧ	Z
November	1009	33	24	36	6 22	91	64	4	5	115	8	4	14	16	3	1	4	7	15	36	4	4 3	6	13	9	10	18	32	5	4	10	#	#	13
December	1008	31	24	33	3 22	96	74	6	6	222	15	4	4	14	1	2	7	12	18	48	4	#	3	1	4	14	28	38	7	3	9	#	#	14
Means	1010	32	23	*38	**18	89	62	2 4	4			2	8	4	14	2	2	5	10	26	3	8 3	18	18	5	6	15	29	3	6	11		├──	
Totals										1344	87			8																		#	#	62
Exteame values				***39	****17																													
, and co		1						1									1	1				1							1				<u> </u>	1
No. of years observation	16				. 16		16	6	16		20									16								•	16	I	16	16	16	3 16

Appendix 2.2.9. Monthly Climatic Data (Kupang / Deltari)

*** - Highest recorded temperature **** - Lowest recorded temperature

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

- Rare## - All obsevations

Appendix 2-2-9

	Average	Т	empera	atures		Averag	e	Averag	e	Precipi	tation					Wind (distribı	ition-P	ercenta	age of c	observa	ation fr	om							Mea	n wind			
	Pressure	Mean	Mean	Mean	Mean	humidi	ty	cloud			No. of			-	-		-													spee	d	Num	ber of o	days with
Month	at MSL	daily	daily	highest	lowest	630	1990	cover	1990		days with	N	NE	Б	CE	c	CW	11/	NIM	Calm	N	NE	Б	CE.	c	CW	147	NIX	Calm	600	1990	Cala	ford	Thursday
		max	mm.	month	month	630	1230	630	1230		or more	IN	INE	E	SE	3	31	vv	IN W	Calm	IN	INE	Е	SE	3	500	vv	INVV	Caim	630	1230	Gale	log	Thunder
	mb			٠c		9	/ D	okta	is	mm																				K	nots			
January	1009	31	25	33	3 20	88	74	5	5	208	15																			6	6			5
February	1009	31	25	39	21	86	73	6	5	217	14																			6	6			4
rebruury	1000	01	20	00			10	Ű	0	217																					0			1
March	1009	31	26	33	3 22	88	75	5	5	193	15																			5	5			10
April	1009	31	25	39	23	90	77	5	5	260	18		-		-															4	5			8
, ibi ii	1000	01	20	00	20			Ű	0	200	10																				0			Ĭ
May	1009	31	25	34	1 21	91	79	6	5	354	20																			4	3			14
June	1009	31	25	35	5 22	91	78	6	5	374	19																			6	6			8
Suite	1000	01	20	00		01	10	Ű		071	10																							
July	1009	30	25	34	1 23	92	81	6	5	374	20																			8	7			7
Angust	1009	29	25	39	22	91	81	7	6	250	17																			10	9			4
nugust	1000	20	20	00		. 01	01		Ŭ	200	17																			10	0			-
September	1009	30	25	33	3 22	91	79	6	5	184	16																			7	7			10
October	1009	31	25	33	3 23	91	75	5	5	213	15		-		-															5	6			13
ottober	1000	01	20		~~~		10	Ŭ	0	210	10																				0			
November	1009	31	26	34	4 24	91	76	5	5	191	14																			3	5			12
December	1008	31	26	39	23	90	77	6	6	201	18																			3	5			8
December	1000	01	20	00	20	00		Ű		201	10																				Ű			
Means	1009	31	25	*34	**22	90	77	6	5																					5	6			
Totals										3019	202																							103
Exteame				***05	****00																													
values				***35	20								+		+														+					
No. of years											1																							1
observation	5				5		5		5		16																				5			5

Appendix 2.2.10. Monthly Climatic Data (Jefman / Sorong)

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

Appendix 2-2-10

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare ## - All obsevations

	Average]	Temper	atures	5.	Avera	ge	Avera	ge	Precipi	tation					Wind o	listribı	ition-P	ercent	age of o	bserva	ation fr	om							Mear	n wind			
Month	Pressure at MSI	Mean daily	Mean daily	Mean highest	Mean lowest	humid	ity	cloud			No. of days with								1			1				1	r	1	1	spee	d	Num	ber of o	days with
	at mol	max	min.	in each	in each	630	1230	630	1230		0.6mm.	Ν	NE	Е	SE	S	SW	w	NW	Calm	Ν	NE	Е	SE	S	SW	w	NW	Calm	630	1230	Gale	fog	Thunder
				month	month						or more																							ļ
Ionuomi	mb 1007	21	99	·(90	04	% 79	Ok	tas e	mm 229	17																		-	K:	nots			16
January	1007	51	23			. 94	14	. 0	0	220	17																			3	0		ľ	10
February	1007	31	23	32	22	96	74	7	6	302	17																			3	8		ľ	14
March	1008	31	24	33	25	96	74	7	6	243	17																			2	7			15
April	1008	31	23	33	22	96	74	6	6	192	13																			1	6			11
May	1009	31	23	33	21	96	74	5	6	80	9																			1	8		I	7
June	1010	30	22	31	19	95	74	5	5	47	8																			1	8			3
																																		L
July	1011	29	21	31	. 18	94	73	5 5	6	38	7																			1	8		ľ	2
August	1011	30	21	32	17	93	70	5	6	19	5																			1	9		I	2
September	1010	30	21	33	17	94	69	5	5	21	4																			1	11			3
October	1009	32	21	35	17	94	68	5	5	22	4																			1	10			9
November	1008	32	23	35	19	94	65	5	4	93	7																			1	9		I	11
December	1007	32	23	34	22	94	69	6	6	207	12																			2	8			19
Maana	1000		99	*05	**10	05	71	0	0																					1	0			l
Means	1009	31		- 35	10	95	/1	. 0	0																					1	0			
Totals										1489	122																							115
Exteame																																		
values				***36	****14																							+						
No. of years observation	5			1	5		5	5	5	5	20					1			I	1		I		1		1	1	1	1		5			5

Appendix 2.2.11. Monthly Climatic Data (Merauke(Mopah), Irian Jaya)

*** - Highest recorded temperature **** - Lowest recorded temperature

- Rare ## - All obsevations

* - Mean of highest each year
 ** - Mean of lowest each year
 Source : British Admiralty Sailing Directions

Apeendix 2-2-11



Appendix 2.2.12. Predominant Surface Currents in the Vicinity of Sumatera (December to February, NE Monsoon)



Appendix 2.2.13. Predominant Surface Currents in the Vicinity of Sumatera (June to August, SW Monsoon)

Appendix 2.2.14. Predominant Surface Currents in the Vicinity of Jawa (November to March)





Appendix 2.2.15. Predominant Surface Currents in the Vicinity of Jawa (May to September)

Appendix 2.2.16.Predominant Surface Currents in the Vicinity of
Sulawesi and Nusarenggara (February, NW Monsoon)


Appendix 2.2.17. Predominant Surface Currents in the Vicinity of Sulawesi and Nusarenggara (August, SE Monsoon)





Appendix 2.2.18. Average Currents in the Vicinity of Irian Jaya (February)



Appendix 2.2.19. Average Currents in the Vicinity of Irean Jaya (August)

Province	Area(km2)	Percentage to total	Percentage to	Population density
	, í	area of Indonesia	total population	per km2
Dista Aceh	55390	2.86	2	75
Sumatera Utara	3.7	5.79	5.79	167
Suamatera Barat	42898	2.21	2.22	107
Riau	94561	4.88	2.08	45
Jambi	53436	2.76	1.25	48
Sumatera Selatan	109254	5.64	3.74	71
Bengkulu	19789	1.02	0.75	79
Lamoung	35385	1.83	3.43	200
Sumatera	482393	24.9	21.28	91
Dki Jakarta	664	0.03	4.65	14465
Jawa Barat	43177	2.23	20.5	980
Jawa Tengah	32549	1.68	15.03	954
DI Yogyakarta	3186	0.66	1.47	958
Jawa Timur	47923	2.47	17.03	734
Jawa	127499	6.58	58.63	951
Bali	5633	0.29	1.48	542
Nusa Tenggara Barat	20153	1.04	1.9	195
Nusa Tenggara Timur	47349	2.44	1.86	81
Timor Timur	14609	0.75		
Nusa Tenggara	87744	4.53	5.24	148
Kalimantan Barat	146807	7.58	1.91	27
Kalimantan Tengah	153564	7.93	0.86	12
Kalimantan Selatan	36535	1.89	1.5	85
Kalimantan Timur	210985	10.89	1.25	12
Kalimantan	547891	28.28	5.52	21
Sulawesi Utara	27488	1.42	1.36	102
Sulawesi Tengah	63689	3.29	1.03	33
Sulawesi Selatan	62483	3.23	3.92	129
Sulawesi Tenggara	38140	1.97	0.84	46
Sulawesi	191800	9.9	7.15	77
Maluku	77871	4.02	1.08	29
Irian Jaya	421981	21.78	1.05	5
<u>Maluku dan Irian Jaya</u>	499852	25.8	2.12	9
Indonesia	1027170	100	100	107
Indonésia	193/179	100	100	107

Appendix 2.3.1. Population Density by Province 1999

Source: Statistic Indonesia

	House	Dryland/	Meadows	Dyke	Water	Tempo-	Wood	Agricul-	Wetland
Province	compounds	Garden/			Pond	rarily	Land	tural	
	and surro-	for crop				fallow		Estate	
	undings	cultivation				land			
Dista Aceh	297419	580379	185436	65816	7301	204316	276746	649532	322367
Sumatera Utara	304212	678800	33394	8091	8091	312031	312031	1758516	532807
Sumatera Barat	112030	438881	33223	511	8720	115245	643427	517834	235160
Riau	382816	588385	14279	32501	3560	326202	248820	1450258	229198
Jambi	136823	469070	23376	414	8584	220280	465556	1211582	220733
Sumatera Seltan	287616	564126	109050	17455	39715	915241	1185587	1912940	512755
Bengkulu	78410	192650	14534	173	3134	200446	241720	323135	89848
Lampung	243327	783411	437	24311	3126	173638	99909	539039	287421
D.K.I. Jakarta	40918	2299	5	90	66	902	124	8	2667
Jawa Barat	497489	1016589	36972	41457	32735	40478	235362	382117	1125597
Jawa Tengah	577590	769145	2765	30857	3565	1663	59414	77145	992042
D.I. Yogyakarta	85272	113646			314	157	17596	692	60096
Jawa Timur	606115	1167580	2402	56123	1558	21097	50715	165225	1148842
Bali	41817	126885	2	707	149	604	13064	126117	87765
Nusa Tenggara Barat	33750	222579	34124	6009	1810	84991	335250	37082	197398
Nusa Tenggara Timur	124074	489609	548672	3464	1117	689512	446889	197531	112467
Timor Timur									
Kalimantan Barat	395788	719164	40964	603	3367	1520671	1319577	1716833	479709
Kalimantan Tengah	252322	369920	12834	2169	9373	282813	499518	733177	284769
Kalimantan Selatan	169507	345369	160881	7155	8218	227003	278406	368400	495302
Kalimantan Timur	214251	248924	23413	15233	2843	935670	1262684	469809	132396
Sulawesi Utara	94417	384893	48687	882	6686	128412	98581	343212	88378
Sulawesi Tengah	64121	344708	76201	6105	3147	537891	326228	1073948	156766
Sulawesi Selatan	175919	672933	278840	114711	8368	256574	487068	544767	725450
Sulawesi Tenggara	114986	318249	94168	7125	3169	341974	229349	417115	70109
Maluku									
Irian Jaya									
Indonesia	5331489	11608194	2056332	467265	168716	7577909	9133621	1.5E+07	8490042

Appendix 2.3.2. Land Utilization by Province,1997(Ha)

Source : Statistik Indonesia 1999

Province	General	Ownership	Building	Utilization	Management
	use right	right	use right	right	right
Daerah Istimewa Aceh	17	424	276	109	0
Sumatera Utara	42	7343	1754	100	0
Sumatera Barat	6	450	297	224	0
Riau	11	1702	832	40	0
Jambi	1	0	0	0	0
Sumatera Seltan	9	619	1385	37	5
Bengkulu	1	0	0	0	0
Lampung	8	1388	58	94	0
D.K.I. Jakarta	0	0	0	0	0
Jawa Barat	5	0	0	0	0
Jawa Tengah	1	0	0	0	0
D.I. Yogyakarta	0	0	0	0	0
Jawa Timur	4	1820	1363	420	0
Bali	0	0	0	0	0
Nusa Tenggara Barat	1	0	0	0	0
Nusa Tenggara Timur	1	0	0	0	0
Kalimantan Barat	8	119	204	156	6
Kalimantan Tengah	6	0	0	0	0
Kalimantan Selatan	5	645	44	39	0
Kalimantan Timur	7	0	0	0	0
Sulawesi Utara	0	0	0	0	0
Sulawesi Tengah	1	0	0	0	0
Sulawesi Selatan	5	1702	832	40	0
Sulawesi Tenggara	0	7812	183	69	12
Maluku	0	0	0	0	0
Irian Jaya	4	0	0	0	0
Indonesia	143	24024	7228	1328	23

Appendix 2.3.3. Land Use Certification by Type of Certification and by Province

	Fores	t concession	Fores	t concession	Fores	t concession	Total	of
	Ρι	ire private	Go	vernment	Joi	n venture	Fores	st concession
	Unit	Area	Unit	Area	Unit	Area	Unit	Area
Daerah Istimewa Aceh	11	831,000	0		7	608,114	18	1,439,114
Sumatera Utara	3	215,500	1	139,100	5	374,309	9	728,909
Sumatera Barat	4	338,530	0		2	112,080	6	450,610
Riau	34	2,732,020	0		10	639,315	44	3,371,335
Jambi	11	919,719	0		3	193,780	14	1,113,499
Sumatera Seltan	10	789,300	1	176,550	2	241,930	13	1,207,780
Bengkulu	2	198,900	0		2	154,000	4	352,900
Kalimantan Timur	55	6,965,680	2	2,400,420	15	1,339,524	72	10,705,624
Kalimantan Selatan	3	444,000	2	358,600	2	154,270	7	956,870
Kalimantan Tengah	44	4,615,400	2	925,000	23	2,674,550	69	8,187,950
Kalimantan Barat	31	4,132,706	1	120,000	7	833,330	39	5,086,036
Sulawesi Utara	8	432,388	0		1	268,000	9	700,388
Sulawesi Tengah	14	1,298,488	0		2	165,000	16	1,463,488
Sulawesi Tenggara	3	473,805	0		0		3	473,805
Sulawesi Selatan	7	387,162	0		1	50,800	9	437,962
Nusa Tenggara Timur	2	80,500	0		0		2	80,500
Maluku	30	2,642,623	0		5	573,086	35	3,215,709
Irian Jaya	52	11,666,673	0		0		52	11,666,673
Indonesia	324	39,164,394	9	4,119,670	87	8,355,088	421	51,639,152

Appendix 2.3.4.	Forest	Concession	Figures	by	Province
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		Marine	Open	Blackish	Fresh		Paddy
Pprovince	Total	Fishery	Water	Water	Water	Cage	Field
_				Pond	Pond		
Dista Aceh	41186	14800	1753	17326	4858	34	2415
Sumatera Utara	72950	26883	11157	1515	10790	3113	19492
Sumatera Barat	79068	7236	25281		41554	1078	3919
Riau	56730	34299	16235	323	5873		
Jambi	22887	20792	8764	173	9763	2002	85
Sumatera Selatan	58499	14694	25134		10588	702	7381
Bengkulu	11104	3166	3558	48	2604		1728
Lampung	51606	6226	8371	17250	13449	150	6160
Sumatera	394030	109399	100253	36635	99484	7079	41180
D.K.I. Jakarta	10081	6503			3578		
Jawa Barat	375021	15098	25134	10680	225587	2403	96119
Jawa Tengah	287527	16327	45669	20748	179861	720	24202
D.I. Yogyakarta	59633	6211	8827		33766	690	10139
Jawa Timur	180093	41608	29155	18587	63125	867	26751
Jawa	912355	85747	108785	50015	505917	4680	157211
Bali	42262	18191	6976	195	6695	26	10179
Nusa Tenggara Barat	44908	16152	15392	3980	5084		4300
Nusa Tenggara Timur	28564	18677	1627	282	7016		962
Timur Timor							
Bali, Nusa, Tim-Tim	115734	53020	23995	4457	18795	26	15441
Kalimantan Barat	16967	6272	4471	365	5022	813	24
Kalimantan Yengah	24607	4709	11626	116	2919	4638	599
Kalimantan Seratan	35996	6705	23039	1220	2235	2452	345
Kalimantan Timur	46091	11251	12497	6308	1365	14670	
Kalimantan	123661	28937	51633	8009	11541	22573	968
Sulawesi Utara	51893	33904	2332	378	6397	1338	7544
Sulawesi Tengah	27149	23227	480	1785	1596	12	49
Sulawesi Selatan	81111	27655	6865	32890	3108		10596
Sulawesi Tnmggara	29033	19552	2967	4295	2138	29	52
Sulawesi	189186	104335	12644	39348	13239	1379	18241
Maluku	36753	36753					
Irian Jaya	57384	36564	8852	544	11219	205	
Maluku, Irian Jaya	94137	73317	8852	544	11219	205	
Indonesia	1829103	454755	306162	139008	660195	35942	233041

Appendix 2.3.5. Number of Fishing Housholds by Province and Fishery Sub Sector 1998

Source: Statistic Indonesia 1999

Appendix 2.3.6. Number of Fishing Housholds, Fishing Boats, Fish Cultured Areas and Quantity of Productions by Fishery Subsector, 1999

Description	Marine	Open	Water	Fresh wate	Cage	Paddy
	fisheries	water	pond	pond	_	field
Fishing houshold	441240	330000	135000	812950	31000	264000
fishing boat	420300	133031				
Cultured area gross			435000	80995	140	153880
net			372629	68724	140	153880
Production(000t)	3950	308	400	185	30	97

Source : Statistics Indonesia

Province	Total	Brackish	ckish Fresh		Paddy
		Water	Water	5	Field
		Pond	Pond		
Dista Aceh	43412	40057	1940	0	1415
Sumatera Utara	23686	5846	4937	3	12900
Sumatera Barat	8206		5916	4	2286
Riau	1957	373	1298	1	285
Jambi	1863	506	1190	4	163
Sumatera Selatan	11252		7155	4	4093
Bengkulu	5701	254	4206		1241
Lampung	58502	51488	3300	0	3714
Sumatera	154579	98524	29942	16	26097
D.K.I. Jakarta	196		196		
Jawa Barat	110824	34312	15432	70	61010
Jawa Tengah	34343	25982	2770	22	5569
D.I. Yogyakarta	2071		685	0	1386
Jawa Timur	85040	59037	3300	9	22694
Jawa	232474	119331	22383	101	90659
Bali	4040	627	1205	0	2208
Nusa Tenggara Barat	10083	6055	1148		2880
Nusa Tenggara Timur	831	412	285		134
Timur Timor	0				
Bali, Nusa, Tim-Tim	14954	7094	2638	0	5222
Kalimantan Barat	3866	1367	1595	1	903
Kalimantan Tengah	300	300			
Kalimantan Seratan	6291	4489	1310	2	490
Kalimantan Timur	13634	13300	334	0	
Kalimantan	24091	19456	3239	3	1393
Sulawesi Utara	7399	701	2293	10	4395
Sulawesi Tengah	7241	6279	940	1	21
Sulawesi Selatan	99225	90608	2058		6559
Sulawesi Tnmggara	12461	11720	716	0	25
Sulawesi	126326	109308	6007	11	11000
Maluku	0	0			
Irian Jaya	446	188	258	0	
Maluku, Irian Jaya	446	188	258	0	
Indonesia	552870	353901	64467	131	134371

Appendix 2.3.7. Fish Culture Areas by Province and Type of Fish Culture (Ha)

Source : Statistic Indonesia 1999

Province	Area(Ha)
Dista Aceh	360640
Sumatera Utara	810500
Suamatera Barat	423102
Riau	155163
Jambi	187802
Sumatera Selatan	527011
Bengkulu	114788
Lamoung	476456
Sumatera	3055462
Dki Jakarta	3251
Jawa Barat	2182219
Jawa Tengah	1676981
DI Yogyakarta	133367
Jawa Timur	1751223
Jawa	5747041
Bali	154203
Nusa Tenggara Barat	324163
Nusa Tenggara Timur	176663
Timor Timur	
Bali, Nusa Tenggara and Timor Timur	655029
Kalimantan Barat	387460
Kalimantan Tengah	140105
Kalimantan Selatan	450037
Kalimantan Timur	140929
Kalimantan	1118531
Sulawesi Utara	90794
Sulawesi Tengah	165666
Sulawesi Selatan	880728
Sulawesi Tenggara	91681
Sulawesi	1228869
Maluku	19681
Irian Jaya	29179
Maluku ahd Irian Jaya	48860
Outside Java	6106751
Indonesia	11853792

Appendix 2.3.8. Harvested Area of Paddy(Wetland+Dryland) by Province,1999

Source: Statistic Indonesia

Company/		Well locat	ion		Total of		
Island	Onshore	Offshore	Sub-total	Oil	Gas	Others	Rigs
1.Pertamina							
Sunatera	2	0	2	2	0	0	2
Jawa	2	0	2	1	0	1	1
Kalimantan	1	0	1	0	0	1	1
Sub-total	5	0	5	3	0	2	4
2.Sharing contract							
Sumatera	56	19	75	27	17	31	34
Jawa	3	2	5	1	0	4	3
Kalimantan	2	45	47	15	5	27	9
Sulawesi	0	0	0	0	0	0	0
Maluku	2	0	2	2	0	0	1
Irian Jaya	2	9	11	0	6	5	4
Sub-total	65	75	140	45	28	67	51
Total	70	75	145	48	28	69	55

Appendix 2.3.9. Number of Drilling Well by Company / Island , Location and Type

Source : Statistic Indonesia

Province	Natura	1	Wildlife F		Recriation		Hunting		Total	
	Conserv	vation	Conser	vation	Parks		Parks	-		
	Unit	На	Unit	На	Unit	На	Unit	На	Unit	На
Daerah Istimewa Aceh	2	8300.00					1	80000.00	3	88300.00
Sumatera Utara	8	12373.00	4	85552.00	3	3038.75	1	8350.00	16	109313.75
Sumatera Barat	5	3325.20			3	610.00			8	3935.20
Riau	3	1100.00	2	145000.00	1	206562.00	1	16000.00	7	164165.62
Jambi	3	6575.00							3	657580%
Sumatera Seltan	1	1.00	7	295657.00	1	50.00			9	295708.00
Bengkulu	7	1780.50			2	14612.00	2	25300.00	11	41692.51
Lampung	1	13330.00							1	13330.00
D.K.I. Jakarta	4	95.02							4	64.40
Jawa Barat	30	50411.00	2	13527.00	16	4578.21	1	12420.70	49	80940.41
Jawa Tengah	25	3019.10			5	253.70			30	3273.00
D.I. Yogyakarta	3	70.10			2	132.10			5	202.02
Jawa Timur	16	10999.90	2	17976.60	3	298.00			21	31650.90
Bali	1	1762.80			3	15845.50			3	16271.80
Nusa Tenggara Barat	1	543.50			4	3041.00	2	52250.00	7	55834.50
Nusa Tenggara Timur	5	29384.00	4	8060.00	4	42748.10	3	14062.00	16	94254.10
Kalimantan Barat	3	5708.00	1	180000.00	2	835.00			6	186543.00
Kalimantan Tengah	3	8261.00			2	2533.00			4	10794.00
Kalimantan Selatan	4	67230.00	1	6000.00	2	1560.00			7	74790.00
Kalimantan Timur	3	114400.00			1	61850.00			5	176530.00
Sulawesi Utara	7	61505.50	1	6500.00	2	1250.00	1	21400.00	11	90655.50
Sulawesi Tengah	2	229246.00	4	5938.00	1	250.00			7	235434.00
Sulawesi Selatan	6	97880.00	3	9390.00	9	105408.00	1	4610.00	19	217288.00
Sulawesi Tenggara	2	509.00	4	126350.00	2	5700.00			8	132559.00
Maluku	10	56269.53	3	14000.00	1	734.46			14	238366.46
Irian Jaya	13	1367712.00	4	2487390.00	6	14258.00			22	3869400.12
Indonesia	168	2150011.45	42	3387813.60	75	486147.82	13	234392.70	296	6237872.12

Appendix 2.3.10. Number and Area of Land Conservation by Province

Province	Natural	Natural Wildlife			Recreation				Total	
	Consevati	on	Consevati	on	Park		Park			
	No.(Unit)	Area(Ha)	No.(Unit)	Area(Ha)	No.(Unit)	Area(Ha)	No.(Unit)	Area(Ha)	No.(Unit)	Area(Ha)
Daerah Istimewa Aceh					2	231400.00			2	231400.00
Sumatera Utara										
Sumatera Barat										
Riau										
Jambi										
Sumatera Seltan										
Bengkulu										
Lampung										
D.K.I. Jakarta							1	108000.00	1	108000.00
Jawa Barat	2	1850.35							2	1850.35
Jawa Tengah							1	111625.00	1	111625.00
D.I. Yogyakarta										
Jawa Timur										
Bali										
Nusa Tenggara Barat									2	8954.00
Nusa Tenggara Timur	1	2000.00			2	8954.00			4	121350.00
Kalimantan Barat	1	77000.00			3	119350.00			1	77000.00
Kalimantan Tengah										
Kalimantan Selatan										
Kalimantan Timur			1	220.00	1	280.00			2	500.00
Sulawesi Utara							1	89065.00	1	89065.00
Sulawesi Tengah										
Sulawesi Selatan					1	50000.00	1	530765.00	2	580765.00
Sulawesi Tenggara							1	1390000.00	1	1390000.00
Maluku	1	114000.00			3	4598.00			4	118598.00
Irian Jaya			2	65000.00	1	183000.00	1	1453500.00	4	1701500.00
Indonesia	5	194850.35	3	65220.00	13	597582.00	6	3682955.00	27	4538757.00

Appendix 2.3.11. Number of Marine Conservation by Province

Province	Areal	Area	Potential
	Name		Code
A. Natural Park			
Sumatera Utara	Sicikeh-cikeh	575.00	1
	Holiday Resort	1963.75	1
	Sijaba Hutaginjang	500.00	1
Sumatera Barat	Mega Mendung	12.50	3,4
	Lembah Harau	27.50	1,3,4,10,11,14
	Rimbo Panti	570.00	1,9
Riau	Muka Kuning	2065.62	1,14,19,21,23
Sumatera Seltan	Punti Kayu	50.00	5
Benkulu	Bukit Kaba	13490.00	1,5,9,10,12
	Pungguk Benakat	1122.00	1
Jawa Barat	Pulau Sangiang	1228.15	1,2
	Sukawayana	16.00	1
	Carita	95.00	2,4
	Telaga Warna	5.00	1,5
	Jember	50.00	1
	Tangkuban Perahu	370.00	1,8,9,11
	Telga Patenggang	65.00	1,5
	Cimanggu	154.00	9
	Gunung Tampomas	1250.00	1,9
	Telga Bodas	23.85	5,8,9
	Gn. Papandayan	225.00	1,4,8,9,10
	Kawah Kamojang	500.00	1,8,9
	Linggarjati	11.51	5,10
	Pananjung Pangandaran	37.70	1,2,7,11,14
	Gunung Pancar	447.00	1,9,33,34
	Situgunung	100.00	1,6
Jawa Tengah	Gunung Selok	126.20	1,2,7,9,10,12,13
	Tuk Songo	6.50	1,10
	Sumber Semen	17.10	I,IU 1 5 9 0 11 14
	Croisgon Source	59.00 64.50	1,0,0,9,11,14
D. I. Vogyalianta	Grojogan Sewu	04.30	1,3,4,12
D. I. Togyakarta	Diawangan Turga	1.10	13,14
Iouro Timur	Trotos	10.00	1,3,4,3,10,11,12
Jawa I IIIu	Cunung Baung	10.00	1 / 19
	Kawah Jien	2468.00	1.4,1%
Bali	Panelokan	£ 100.00	1,0
Dun	Sangeh	13969.00	13 18
NTB	Banko-banko	2169.00	19,10
	Suranadi	52.00	10.13
	Pelangan	500.00	1.2.15.16
	Kelandangan	320.00	1.3
	P. Satonda	2600.00	1.3
NTT	Tuti Adagae	5000.00	2.10
	Pulau Besar	3000.00	16,30
	Manipo	2499.50	1
	Ruteng	32248.60	1,2,4,6
Kalimantan Selatan	Pleihari	1500.00	34
	Pulau Kembang	60.00	7
Kalimantan Tengah	BukitTangkiling	533.00	
	Tanjung Keluang	2000.00	1,7

Appendix 2.3.12. Potential National Park Area by Province,1999

II			
Kalimantan Barat	Baning	315.00	1
	Gunung Kelam	529.00	1
Kalimantan Timur	Bukit Soeharto	61850.00	1
Sulawesi Utara	Batu Angus	635.00	2
	Batu Putih	615.00	2
Sulawesi Tengah	Air Terjun Wera	250.00	4
Sulawesi Seltan	Banti Murung	18.00	2,3,10,11,12
	Goa Patunuang	1500.00	11,14
	Danau Towuti	65000.00	6
	Danau Matano	30000.00	6
	Cani Sirenrang	3125.00	1,4
	Sidrap	500.00	4.11
	Malino	3500.00	1,4,35
	Nanggala III	500.00	1.4,11
	Liiia	1265.00	-,-,
Sulawesi Tenggara	Tirta Rimba	500.00	4.10
	Manggolo	5200.00	9
Maruku	Gn Ani Banda	734.46	1
Irian Java	Teluk Yotefa	1650.00	1 2.6
in an ouya	Sorong	945.00	1,~,~
	Cunung Meia	500.00	1
	Nahira	100.00	-
	Roriat	9193 75	
	Klamoto	1909 37	
R Natural Recreational	Dark	1303.57	
Daorah Istimewa Aceh	D Woh	3900.00	1 2 7
Datran Istiniewa Acen	Konulauan Banyak	227500.00	1,~, '
Kalimantan Timur	D Sangalaki	280.00	1
Nusa Tanggara Barat	Cili Mono Cn Trawangan	2954.00	1 9
Nusa Teliggara Darat	Dulan Mayo	6000 00	1, 4
Nusa Tonggara Timur	Taluk Maumara	59450.00	10,10,20,30
Nusa renggara rimur	Teluk Maunere	50000 00	1
	Tuiuh Bolos Dulou	9000.00	1
Colourse Colton	Tujuli Delas Fulau Van Kananagang	5000.00	
	Kep. Kepoposang	2500.00	1
машк	Laman Laut Banua	200.00 1100.00	
	P. Kassa	1100.00	1
Tuton Torro	P. Pombo Ver Deidede	998.00	1
Irian Jaya	Kep. Paidado	183000.00	
Note : Potential Code	0 D h	0 17-11	4 Weter Fall
1. Beautiful view	2. Beach	3. Valley	4. water Fall
5. Pond	6. Lake	7. Sea	8. Crater
9. Hotwater Spring	10. Water Well	11. Cave	12. River
13. Inheritance of Culture	14. Samber Deer	15. Wild Boar	16. Small Antelope
17. Dwarf Buttalo	18. Ape	19. Wild Cow	20. Mouse Deer
21. Deer-hog	22. Black/Gray Long-tailed	Monkey	23. Black Sheep
24. Wild Buffalo	25. Tapir	26. Sumatera Tiger	27. Elephant
28. Sumateran Rhiroceros	29. Deer	30. Panther	31. Burung Enggan
32. Eagle	33. White Sand	34. Cool Air	35. Wild Duck

Appendix 2.3.12 Continuation

Province	Name of Area	Area	Note
Sumatera Utara	Bukit Barisan	51600	SM Langkat Selatan 13000Ha
			HL Sinambung 13448Ha
			HL Simancit I & II 11455Ha
			TW Lau Debuk 7Ha
			CA Sibolangit 120Ha
			Bumi Perkemahan 200Ha
			TW Sibolangit 2485Ha
Sumatera Barat	Dr.Mohammad Hatta	500	
Riau	Sultan Syarif Hasim	5920	
Bengkulu	Raja Lelo	1122	
Lampung	Wan Abdul Rachman	22244	
Jawa Barat	Ir. H. Juanda	590	
Jawa Timur	R. Suryo	25000	
Bali	Nguruah Rai	1374	
Kalimantan Selatan	Sultan Adam	112000	HL Riam Kanan 55000Ha
			HL Kinain Buak 13000Ha
Nusa Tenggara Timur	Prof. Ir. Herman Yohannes	1900	
Sulawesi Tengah	Palu	8100	
Sulawesi Tenggara	Murhum	8146	
Total		238496	

Appendix 2.3.13. Name, Location and Area of Grand Forest Park by Province,1999

Province	Name of National Park	Area
A. National Park		
Daerah Ismewa Aceh & Sumatera Utara	Gunung Leuser	1094692.00
Suamatera Barat	Siberut	190500.00
Suamatera Barat, Jambi, Bengkulu &		
Sumatera Sultan	Kerinci Seblat	1368000.00
Riau, Jambi	Bukit Tiga Puluh	127698.00
Jambi	Berbak	162700.00
Lampung dan Bengkulu	Bukit Barisan Selatan	365000.00
Lampung	Way Kambas	130000.00
Jawa Barat	Ujung Kulon	122956.00
	Gunung Gede Pangrango	15000.00
	Gunung Halimun	40000.00
Jawa Timur	Bromo Tengger Semeru	50276.20
	Meru Betiri	58000.00
	Baluan	25000.00
	Alas Purwo	43420.00
Bali	Bali Barat	19002.89
Kalimantan Barat	Gunung Palung	90000.00
	Bentuang Karimun	800000.00
	Sentarum	129700.00
Kalimantan Barat-Kalimantan Tengah	Bukit Baka-Bukit Raya	181090.00
Kalimantan Tengah	Tanjung Putting	415040.00
Kalimantan Timur	Kutai	198629.00
	kayan Mentarang	1360500.00
Nusa Tenggara Barat	Gunung Rinjani	40000.00
Nusa Tenggara Timur	Kelimutu	5000.00
	Komodo	173300.00
	Laiwangi-Wanggameti	47014.00
	Manepau-Tanah Daru	87984.09
Sulawesi Utara	Bogani Naui Warutabone	287115.00
Sulawesi Tengah	Lore Lindu	229000.00
Sulawesi Tenggara	Rawa Aopa Watumohai	105194.00
Maluku	anusera	189000.00
Irian Jaya	Wassur	413810.00
5	Lorentz	2505600.00
B. Marine National Park		
DKI Jakarta	Keplauan Seribu	108000.00
Jawa Tengah	Keplauan Karimun Jawa	111625.00
Sulawesi Utara	Bunaken	89065.00
Sulawesi Seltan	Taka Bone Rate	530765.00
Sulawesi Tenggara	Kepulauan Watatobi	1390000.00
Irian Jaya	Teluk Cendrawasih	1453500.00

Appendix 2.3.14. Name, Location and Area of National Park by Province,1999

Province	Name of Area	Regency	Area
Daerah Istimewa Aceh	1.Aceh Rafresia I/II Serbojadi	Aceh Timur	300.00
	2.Hultan Pinus Janthoi	Aceh Besar	8000.00
Sumatera Utara	1.Dolok Saut/Sulungan	Tapanuli Utara	39.00
	2.Doluk Tinggi Raja	Simalungun	167.00
	3.Batu Gajah	Simalungun	1.00
	4.Batu Ginurit	Labuhan Batu	0.50
	5.Liang Balik	Labuhan Batu	0.50
	6.Dolok Simbual-bual	Tapanuli Seltan	5000.00
	7.Doluk Sipirok	Tapanuli Seltan	6970.00
	8.Maruteru Purba	Tepanuli Utara	195.00
Sumatera Barat	1.beringin Sati	Tanah Datar	0.30
	2.Lembah Anai	Tanah Datar	221.00
	3.Batang Palupuh	Agam	3.40
	4.Rimbo Panti	Pasaman	2830.00
	5.Lembah harau	Lima Puluh Koto	270.50
Riau	1.Pulau Burung	Keplauan Riau	200.00
	2.Pulau Laut	Keplauan Riau	400.00
	3.Pulau Berkeh	Benkalis	500.00
Bengkulu	1.Dusun Brsar	Bengkulu Utara	1777.00
	2.Konak	Rejang Lebong	0.08
	3.Cawang I/II	Rejang Lebong	0.22
	4.Despatah I/II	Rejang Lebong	0.26
	5.Pagar Gunung I/II/III	Rejang Lebong	0.21
	6.Taba Pananjung	Benkulu Utara	1.24
	7.Manna	Benkulu Utara	1.50
Jambi	1.Gua Ulu Tingo	Sorolagun/Bangko	1.00
	2.Kel.Hutan Bakau Pantai Timur	Tanjung Jabung	6500.00
	3.Kel.Hutan Bulian Lucuk I/II	Jambi	74.80
Sumatera Seltan	1.Bunga Maskikim	Lahat	1.00
Lampung	1.Gunung Krakatau	Lampung Seltan	13735.10
DKI Jakarta	1.Pulau Bokor	Jakarta	18.00
	2.Pulau Rambut	Jakarta	45.00
	3.Depok(Pancoran Mas)	Kotip Depok	7.00
Jawa Barat	1.Malabar	Bandung	8.30
	2.Arca Domas	Cianjur	2.00
	3.Takokak	Cianjur	50.00
	4.Yunghun	Bandung	2.50
	5.Nusa gede Panjuru	Ciamis	16.00
	6.Cigenteng Cipanji	Bandung	10.00
	7.Telaga Patenggang	Bandung	150.00
	8.Sukawayana	Sukabumi	30.50
	9.Cadas Malang	Cianjur	21.00
	10.Rawa Danau	Serang	2500.00
	11.Gn.Papandayan	Garut	6620.00
	12.Telaga Bodas	Garut	263.15
	13.Cibanteng	Cianjur	447.00
	14. Tangkuban Perahu(Pel. Ratu)	Sukabumi	33.00
	15.Dungus Iwul	Sukabumi	9.00
	16.Pulau Dua	Serang	30.00
	17.Rawa Cipanggang	Ciamis	125.00
	18.Telga Warna	Cianjur	368.25
	19.Gunung Jagat	Sumedang	126.70
	20.Yanlapa	Bogor	32.00

Appendix 2.3.15. Name, Location and Area of Consevation Area by Province, 1999

Appendix 2.3.15 Continuation

Jawa Barat	21.Bojonglarang Jayanti	Cianjur	750.00
	22.Gn.Tangkuban erahu(Bandung)	Bandung	1290.00
	23.Gunung Tilu	Bandung	8000.00
	24.Leuweung Sancang	Garut	2157.00
	25.Gn.Simpang	Cianjur/Bandung	15000.00
	26 Kawah Kamojang	Bandung/Garut	7500.00
	27 Gn Tukung Gede	Serang	1700.00
	28 Gn Barungrang	Bandung	1700.00
	29 Pananjung Pangandaran	Ciamis	/19.30
	30 Cn Moga Mondung	Cianiur	50.00
Jawa Tengah	1 Koling I/II/III	Jonara	65.80
Sawa Tengan	2 Decen Subah I/II	Potong	20.00
	2. Fesuli Subali 1/11	Datalig	30.00 71.00
	A Cohungon (Cunung Ungeron)	Datalig	/1.00
	4.Gebungan (Gunung Ungaran)	Semanang	1.00
	5.Sepakung	Semarang	2.30
	6.Pringombo 1/11	Banjarnegara	58.00
	7. Telgo Ranjeng	Pemalang	18.50
	8.Guci	Pemalang	2.00
	9.Curug Bengkawah	Pemalang	1.50
	10.Vak 50 Comal	Pemalang	24.10
	11.Moga	Pemalang	1.00
	12.Bantar Bolang	Pemalang	24.10
	13.Sub Vak 18c &19b	Tegal	6.60
	14.Getas	Semarang	1.00
	15.Pager Wunung Darpono	Kendal	30.00
	16.Nusakambangan Barat	cilacap	928.00
	17.Wijayakusuma	cilacap	1.00
	18.Karang Bolong	cilacap	0.50
	19.Telogo Sumurup	Banjarnegara	20.10
	20.Telogo Dringo	Banjarnegara	26.10
	21.Gunung Celering	Jepara	1328.40
	22.Gunung Butak	Rembang	45.10
	23.Bekutuk	Blora	25.00
	24.Nusa Kambangan Timur	Cilacap	277.00
	25.Cabak	1	30.00
DI Yogyakarta	1.Teluk Baron	Gunung Kidul	2.40
	2.Gunung Batu Gamping	Sleman	0.20
	3.Plawangan Turgo	Sleman	67.50
Jawa Timur	1.Gua Nglirip	Bojonegoro	3.00
	2.Besowo Gadungan	Kediri	7.00
	3.Manggis Gadungan	Kediri	12.00
	4 Gunung Picis	Ponorogo	27.00
	5 Pulau Noko & Pulau Nusa	Surabaya(Bawean)	15.00
	6 Saobi(Kangean)	Sumenen(Madura)	430.00
	7 Cunung Sigogor	Poporogo	100.00
	8 Pulau Baween	Surahava	795 AA
	9 Curah Manis Compolan	Jombor	16 QO
	10 Dancur Jian I/II	Bondowoso	10.00
	10.1 alitul 1jeli 1/11 11 Sungai Kalubu Iyang Dlataay	Bondowoso	9.00 10 00
	12 Nusa Doming	Jonhon	10.0U 6100.00
	12 Coding	Dendemos	0100.00
	13. Ceding	Donaowoso Malanz	50.40
	14. Pulau Sempu	Ivialang	877.00
	10 K L L L	Pasuruan	50.40
	16.Kawan IJen Ungup-ungup	Banyuwangi	2468.00
inusa renggara rimur	LI.GUIIUNG LANGGAIIRU	isumba 1 mur	15038.84

<u>Ippendix worlds</u>			
Nusa Tenggara Timur	2.Maubesi	Belu	1830.00
	4.Watu Ata	Ngodo	4898.80
	5.Wolo Tado, Ngede Nalo Merah Siung	Ngodo	4016.80
Nusa Tenggara Barat	1.Tanah Peduah	Sumbawa	543.50
Bali	1.Batukahu I/II/III	Buleleng/Tabanan	1762.80
Kalimantan Barat	1.Mandor	Pontianak	2000.00
	2.Lo Pat Fun Pi	Sambas	8.00
	3.Gunung Raya Pasi	Sambas	3700.00
Kalimantan Tengah	1.Bukit Tangkiling	Palangkaraya	2061.00
	2.Pararawen I/II	Brito Utara	6200.00
	3.Bukit Sapat Hawung		239000.00
	4.Lamandau		76110.00
Kalimantan Selatan	1.Pulau Kaget	Barito Kuala	85.00
	2.Gn.Kentawan	Hulu Sungai Selatan	245.00
	3.Teluk Kelumpang Salat Laut/Sebuki	Kota Baru	66650.00
	4.Gn.Sebatung	Kota Baru	250.00
Kalimantan Timur	1.Padang Luwai	Kutai	5000.00
	2.Muara Kaman Sedurang	Kutai	62500.00
-	3.Ampar	Pasir	46900.00
Sulawesi Utara	1.Tangkoko Batu Augus	Manado	3196.00
	2.Gunung Lokon	Minahasa	100.00
	3.Mas Popaya Raja	Gorontalo	160.00
	4.Tanggale	Gorontalo	112.50
	5.Panua	Gorontalo	45000.00
	6.Gunung Ambang	Bolaang angondow	8638.00
	7.Dua Sandara	Manado/Bitung	4299.00
Sulawesi Tengah	1.Tanjung Api	Poso	4246.00
	2.Morowali	Poso	225000.00
	3.Pangi Binanga	-	6000.00
Sulawesi Seltan	1.Karaenta	Luwu	1000.00
	2.Peg.Faruhumpenai	Luwu	90000.00
	3.Bulu Saraung	Maros	5690.00
	4.Kalaena	Luwu	110.00
	5.Ponda-ponda	Tana Toraja	80.00
Calaria et Tara etetaria	6.Bantimurung	Maros	1000.00
Sulawesi Tenggara	1.Napadalano	Muna Kalaha	9.00
Mohalulaa	2.Lamedae	Nolaka Molului Tongoh	<u> </u>
Maluku	2 Dulou Sobo	Maluku Tengan Maluku Utoro	00.00 1250.00
	2. Fulau Sello 2 Dulau Nuswatar	Maluku Utara Maluku Tonggara	7500.00
	4 Pulau Nustaran	Maluku Tenggara	3200.00
	5 Pulau Angwarmasa	Maluku Tenggara Maluku Tenggara	800.00
	6 Pulau Larat	Maluku Teliggara	4505.00
	7 Daah	Maluku Tenggara	14218.00
	8 Gunung Sibela	Maluku Tenggaru	23024.00
	9 Lifamatola		1690 53
	10 Pulau Pombo	Maluku Tengah	2.00
	11 Mashait	inarana rengan	6250.00
Irian Java	1. Misool Selatan	Sorong	84000.00
	2.Yapen Tengah	Yapen Waropen	59000.00
	3.Pegunungan Cycloop	Javapura	22500.00
	4.Enarotali	Nabire	300000.00
	5.P. Waigeo Barat	Sorong	153000.00
	6.Batanta Barat	Sorong	10000.00
	7.Salawati Utara	Sorong	57000.00

Appendix 2.3.15. Continuation

Irian Jaya	8.Pulau Supriori	Teluk Cendrawasih	42000.00
	10.Wondi Boy	Manokwari	73022.00
	11.Tamrau Utara		368365.00
	12.Arfak		68325.00
	13.P. Waigeo Timur	Sorong	119500.00

Appendix 2.3.15 Continuation

Province	Name of Area	Regency	Area
Daerah Istimewa Aceh	Rawa Singkil		102500.00
Sumatera Utara	Dolok Surungan	Tapanuli Utara	23800.00
	Kr. Gading Langkat Timur	Langkat/Deli Serdang	15765.00
	Barumun	Tapanuli Tengah	40330.00
	Siranggas	Tapanuli Selatan	5657.00
Riau	Kerumuntan	Kampar Indragiri Ulu	120000.00
	Danau P. Besar/D. Bawah	Bengkalis	25000.00
Sumatera Seltan	Gumai Pasemah	Lahat	45883.00
	Gunung Raya	Ogan Komering Ulu	39500.00
	Isau-isau Pasemah	Lahat/Liot	12144.00
	Dangku	Banyuasin	29080.00
	Bentayan	Banyuasin	19300.00
	Padang Sugihan	Banyuasin	75000.00
	Terusan Dalam	Banyuasin	74750.00
DKI Jakarta	Muara Angke	Jakarta	25.02
Jawa Barat	Cikepuh	Sukabumi	8127.50
	Gunung Sawal	Ciamis	5400.00
Jawa Timur	Bawean	Surabaya	3831.60
	Dataran Tinggi Yang	Jember, Probiringgo	14145.00
Kalimantan Barat	Gn. Nyiut Perinsen	Pontianak/Sambas	180000.00
Kalimantan Timur	P. Semama	Berau	220.00
Sulawesi Utara	Gn. Manembo-nembo	Minahasa	6500.00
Sulawesi Tengah	Pati-pati	Banggai	3500.00
	Lombuyan I/II	Banggai	3665.00
	Dolangan	Buol Toli-toli	462.50
	Pinjam/Tanjung Matop	Buol Toli-toli	1612.50
	Bakiriang		12500.00
Sulawesi Selatan	Lampoko Mampic	Polowali	2000.00
	Bonto Bahari	Bulkumba	4000.00
	Komara	Takalar	3390.00
Sulawesi Tenggara	Tj. Amelengo	Kendari	850.00
	Buton Utara	Muna	82000.00
	Tj. Baticolo	Kendari	5500.00
	Tj. Peropa	Kendari	38000.00
Nusa Tenggara Timur	Harlu	Kupang	2000.00
	Kateri	Belu	4560.00
	Perhalu	Kupang	1000.00
	D. Duodde	Kupang	500.00
Maluku	Pulau Baum	Maluku Tenggara	13000.00
	Pulaka Kassa	Maluku Tengah	900.00
	Pulau Manuk	Maluku Tengah	100.00
Irian Jaya	Pulau Dolok	Merauke	600000.00
	Jayawijaya	Jayawijaya	800000.00
	Danau Bian		69390.00
	Foja	Jayapura	1018000.00
	Kep. Raja Ampat	Fak-fak	60000.00
	Sabuda Tataruga	Fak-fak	5000.00

Appendix 2.3.16. Name, Location and Areas of Wildlife Conservation by Province,1999

Province	Name of Area	Regency	Area	Potential
Daerah Istimewa Aceh	Lingga Isaq	Aceh Tengah	80000.00	2,3,5,7,8
Sumatera Utara	Pulau Pini	Nias	8350.00	
Riau	Pulau Rempang	Keplauan Riau	16000.00	2
Bengkulu	Semidang Bukit Kabu	Bengkulu Utara	15300.00	2,3
	Gunung Nanu'ua	Bengkulu Utara	10000.00	2
Jawa Barat	Gn. Masigit Kareumbi	Sumedang,Garut	12420.70	1,2,3,4
Nusa Tenggara Barat	Tambora Selatan	Dompu	30000.00	2,4
	Pulau Moyo	Sumbawa	22250.00	2,3,4
	Dataran Bena	Timor Tengah	11000.00	2,4
Nusa Tenggara Timur	Pulau Rusa	Alor	1500.00	2
	Pulau Ndano	Kupang	1562.00	8
Sulawesi Utara	Karakelang Utara dan Seltan	Sanjir-Talaut	21400.00	2,4
Sulawesi Selatan	Komara	Takalar	4610.00	2
Sulawesi Tenggara	Mata Osu		8000	
Note : Potential Code	1.Wild Boar 2.Small Antelop	pe 3.Wild Cow	4.Mouse Dee	r
	5.Deer-Hog 6.Black Sheep	7.Wild Buffalo	8.Deer	

Appendix 2.3.17. Name, Location and Areas of Hunting Park by Province, 1999

Appendix 2.3.18. List of Fixed Marine Conservation Area (Excluding Marine Park) by Province, 1999

Province	Name of Park	Status of Area	Regency	Area
Daerah Istimewa Aceh	Pulau Weh	TW	Aceh Utara	3900
	Kep. Banyak	TW	Aceh Seltan	227500
Lampung	P. Krakatau	CA	Lampung Selatan	11200
	Bukit Barisan Selatan	CA	Lampung Selatan	21600
DKI Jakarta	Kep. Seribu	TN	DKI Jakarta	108000
Jawa Barat	Pulau Sangiang	CA	Serang	700.35
	Leuweung Sancang	CA	Garut	1150
	P. Dua	CA	Serang	30
Jawa Tengah	Kep. Karimun Jawa	TN	Jepara	111625
Nusa Tenggara Barat	P. Moyo	TW	Sumba	6000
	Gili Ayer, Gili Meno,Gili Trawang	TW	Lombok Barat	2954
Nusa Tenggara Timur	P. Teluk Maumere	TW	Sikka	5945
	Tujuh Belas Pulau	TW	Ngada	9000
	Teluk Kupang	TW	Kupang	50000
	Riung	SM	Kupang	2000
Kalimantan Timur	P. Semama	SM	Berau	220
	P. Sangalaki	TW	Berau	280
Kalimantan Barat	Kep. Karimata	CA	Ketapang	77000
Sulawesi Tenggara	Kep. Wakatobi	TN	Buton	1390000
Sulawesi Selatan	Taka Bone Rate	TN	Selayar	530765
	Kep. Kapoposang	TW	Pankep	50000
Sulawesi Utara	Bunaken	TN	Minahasa	89065
Maluku	P. Bombo	TW	Maluku Tengah	998
	Laut Banda	CA & TW	Maluku Tengah	2500
	P. Kassa	TW	Maluku Tengah	1100
		SM	Maluku Tengah	900
	Kep. Aru Tenggara	CA	Maluku Tengah	114000
Irian Jaya	Kep. Raja Ampat	SM	Fak-fak	60000
	Sabuda Tataruga	SM	Fak-fak	5000
	T. Cenderawasih	TN	Yapen Warapen	1453500
	Kep. Paidado	TW	Biak	183000

Note : CA=Natural Preserve, TN=National Park, TW=Recreational Park, SM=Wildlife Prese

Source : Forest Protecton and Nature Construction Statistics

Province	Name of Park	Regency	Area
Daerah Istimewa Aceh	Raflesia (1) Serbojadi	Aceh Timur	300.00
	Hutan Pinus Janthoi	Aceh Besar	8000.00
	Rawa Singkil		102500.00
	Lingga Isaq	Aceh Tengah	80000.00
	Gunung Leuser	Aceh Tenggara	1094692.00
Sumatera Utara	Dolok Saut/Sulungan	Tapanuli Utara	39.00
	Batu Gajah	Simalungun	1.00
	Dolok Tinggi Raja	Simalungun	167.00
	Batu Ginurit	Labuan Batu	0.50
	Liang Balik	Labuan Batu	0.50
	Dolok Sipirok	Taoanuli Seltan	6970.00
	Sibual-Buali	Tapanuli Selatan	5000.00
	Martelu Purba		195.00
	Dolok Surungan	Tapanuli Utara	23800.00
	K. Gading Langkat Timur La	Langkat /Deli Serdang	15765.00
	Barumun	Tapanuli Tengah	40330.00
	Siranggas	Tapanuli Selatan	5657.00
	Pulau Pini	Nias	8350.00
	Bukit Barisan	Karo/D.S. Langkat	51600.00
	Sicikeh-cikeh	Dairi	575.00
	Holiday Resort	Labuhan Batu	1963.75
	Sijaba Hutaginjang	Tapanuli Utara	500.00
Sumatera Barat	Beringin Sati	Tanah Datar	0.30
	Lembah Anai	Tanah Datar	221.00
	Batang Palupuh	Agam	3.40
	Lembah Harau	Lima Puluh Koto	270.50
	Rimbo Panti	Pasman	2830.00
	Dr. Mohamad Hatta	Padang	500.00
	Siberut	Padang Priaman	190500.00
	Mega Mendung	Tanah Datar	12.50
	Lemban Harau Dreha Danti	Lima Pulun Koto	27.50 570.00
D!	Rmbo Panti	Pasaman Kanalanan Dian	570.00
Riau	Pulau Laut Dulau Barkah	Reputation Riau	400.00
	r ulau Del Kell Dulau Burung	Konulauan Diau	200.00
	Korumutan	Kampar/Indragiri I Ilu	120000 00
	D P. Bosar/Danau Bawah	Rampai/muragiri Olu Bonkais	25000.00
	Pulau Rempang	Ken Riau	16000.00
	Sultan Sarif Hasvim	Kep. Mau	5920.00
	Muka Kuning (Batan)	Kodya Batam	2065 62
Jambi	Kel, Ht. Bakau Pantai Timur	Taniung Jabung	6500.00
	Kel. Ht. Bulian Luncuk I/II	Jambi	74.80
	Gua Ulu Tingko	Sarko	1.00
	Berbak	Tanjung Jabung	162700.00
	Bukit Tiga Puluh	Bungo Tebo, Indragiri	127698.00
	Kerinci Seblat	Benkulu Utara, Rejang Le	bong
Sumatera Seltan	Bunga Maskikim		1.00
	Gumai Pasemah	Lahat	45833.00
	Gunung Raya	Ogan Komering Ulu	39500.00
	Isau-isau Pasemah	Lahat/Liot	12144.00
	Bentayan	Banyuasin	19300.00
	Dangku	Banyuasin	29080.00
	Padang Suguhan	Banyuasin	75000.00
	Terusan Dalam		74750.00

Appendix 2.3.19. List of Fixed Conservation Area (Excluding Marine Park) by Province, 1999

A	pp	endix	2.3 .	19 (Cont	inu	ati	on
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Bengkulu Konak Rejang Lebong 0.08 Manna Benkulu Utara 0.26 Manna Benkulu Utara 1.50 Pager Gunung I/II/III Rejang Lebong 0.21 Taba Pananjung Bekulu Utara 1.24 Gawang I/II Rejang Lebong 0.22 Dusun Besar Benkulu Utara 1777.00 Semidang Bukit Kabu Benkulu Utara 15300.00 Gunung Nanu'ua Benkulu Utara 10000.00 Raja Lebo 1122.00 1122.00 Bukit Kaba Rejang Lebong 13490.00 Pungguk Benakat Benkulu Utara 1122.00 Lampung P. Anak Krakatau Lampung Selatan 22244.00 Way Kambas Lampung Tengah 130000.00 Bukit Barisan Seltan Benkulu Seltan, Lampung Utara 365000.00 DKI Jakarta Depok (Pancoran Mas) Kotip Depok 7.00 Pulau Bokor Jakarta 45.00 36500 Jawa Barat Cadas Malang Sukawayana 30.50 Telaga	Sumatera Seltan	Punti Kayu	Palembang	50.00
Despatah I/IIRejang Lebong0.26MannaBenkulu Utara1.50Pager Gunung I/II/IIRejang Lebong0.21Taba PananjungBekulu Utara1.24Gawang I/IRejang Lebong0.22Dusun BesarBenkulu Utara1777.00Semidang Bukit KabuBenkulu Utara15300.00Gunung Nanu'uaBenkulu Utara1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta45.00Mara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00Raga PatenggangBandung15.00Raga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi33.00Pungas IwulSukabumi33.00Punga BodasGarut263.15CibantengCianjur447.00Pananjung PangandaranSukabumi33.00Pungas IwulSukabumi33.00Pungas IwulSukabumi34.90Pungas IwulSukabumi30.00Pungas IwulSukabumi419.30Pungag	Bengkulu	Konak	Rejang Lebong	0.08
MannaBenkulu Utara1.50Pager Gunung I/II/IIIRejang Lebong0.21Taba PananjungBekulu Utara1.24Gawang I/IIRejang Lebong0.22Dusun BesarBenkulu Utara1777.00Semidang Bukit KabuBenkulu Utara15300.00Gunung Nanu'uaBenkulu Utara110000.00Raja Lebo1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00Rawa DnauSerang2500.00Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi30.90Punanjung PangandaranCiamis419.30	8	Despatah I/II	Rejang Lebong	0.26
Pager Gunung I/II/IIIRejang Lebong0.21Taba PananjungBekulu Utara1.24Gawang I/IIRejang Lebong0.22Dusun BesarBenkulu Utara1777.00Semidang Bukit KabuBenkulu Utara15300.00Gunung Nanu'uaBenkulu Utara10000.00Raja Lebo1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi30.90Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Manna	Benkulu Utara	1.50
Taba PananjungBekulu Utara1.24Gawang I/IIRejang Lebong0.22Dusun BesarBenkulu Utara1777.00Semidang Bukit KabuBenkulu Utara15300.00Gunung Nanu'uaBenkulu Utara10000.00Raja Lebo1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara36500.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi33.00Pananjung PangandaranCiamiss419.30		Pager Gunung I/II/III	Rejang Lebong	0.21
Gawang I/IIRejang Lebong0.22Dusun BesarBenkulu Utara1777.00Semidang Bukit KabuBenkulu Utara15300.00Gunung Nanu'uaBenkulu Utara10000.00Raja Lebo1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel R.)Sukabumi30.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Taba Pananjung	Bekulu Utara	1.24
Dusun BesarBenkulu Utara1777.00Semidang Bukit KabuBenkulu Utara15300.00Gunung Nanu'uaBenkulu Utara10000.00Raja Lebo1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan22244.00Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Gawang I/II	Rejang Lebong	0.22
Semidang Bukit Kabu Gunung Nanu'ua Raja LeboBenkulu Utara15300.00 Benkulu UtaraRaja Lebo1122.00Bukit KabaRejang Lebong Benkulu Utara11490.00 Pungguk BenakatLampungP. Anak KrakatauLampung Selatan13735.10 Uwan Abdul RachmanWan Abdul RachmanLampung Selatan22244.00 Benkulu Selatan13000.00 22244.00 Benkit Barisan SeltanDKI JakartaDepok (Pancoran Mas)Kotip Depok7.00 Pulau BokorPulau BokorJakarta18.00 Pulau RambutJakarta18.00 25.02Jawa BaratCadas Malang SukawayanaCianjur Serang21.00 2500.00 2500.00Jawa BaratCadas Malang Cianjur21.00 25.02Jawa BaratCadas Malang Cianjur2500.00 2500.00 30.01 2500.00 2500.00Jawa BaratCadas Malang SukabumiSerang Cianjur2500.00 2500.00 2500.00 30.01 30.00 30.		Dusun Besar	Benkulu Utara	1777.00
Gunung Nanu'ua Raja LeboBenkulu Utara10000.00 1122.00Bukit Kaba Pungguk BenakatRejang Lebong Benkulu Utara13490.00 1122.00LampungP. Anak Krakatau Wan Abdul Rachman Bukit Barisan SeltanLampung Selatan22244.00 13000.00 22244.00DKI JakartaDepok (Pancoran Mas) Pulau BokorKotip Depok7.00 7.00 7.00DKI JakartaCadas Malang SukawayanaJakarta18.00 25.02Jawa BaratCadas Malang CianjurCianjur21.00 2500.00 2500.00Jawa BaratCadas Malang CianjurSerang Cianjur2500.00 2500.00 2500.00 2500.00 2500.00 2500.00Jawa BaratCadas Malang CianjurCianjur 21.00 25022500.00 2502.00Jawa BaratCadas Malang Cianjur21.00 2502.00 2500.00 2502.00Jawa BaratCadas Malang Cianjur21.00 2502.00 2500.00 2502.00Jawa BaratCadas Malang Cianjur21.00 2500.00 250		Semidang Bukit Kabu	Benkulu Utara	15300.00
Raja Lebo1122.00Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Gunung Nanu'ua	Benkulu Utara	10000.00
Bukit KabaRejang Lebong13490.00Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Raja Lebo		1122.00
Pungguk BenakatBenkulu Utara1122.00LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Bukit Kaba	Rejang Lebong	13490.00
LampungP. Anak KrakatauLampung Selatan13735.10Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah13000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi30.50Pananjung PangandaranCiamis419.30		Pungguk Benakat	Benkulu Utara	1122.00
Wan Abdul RachmanLampung Selatan22244.00Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi33.00Pananjung PangandaranCiamis419.30	Lampung	P. Anak Krakatau	Lampung Selatan	13735.10
Way KambasLampung Tengah130000.00Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi33.00Pananjung PangandaranCiamis419.30		Wan Abdul Rachman	Lampung Selatan	22244.00
Bukit Barisan SeltanBenkulu Seltan, Lampung Utara365000.00DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi30.50Pananjung PangandaranCiamis419.30		Way Kambas	Lampung Tengah	130000.00
DKI JakartaDepok (Pancoran Mas)Kotip Depok7.00Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi30.50Pananjung PangandaranCiamis419.30		Bukit Barisan Seltan	Benkulu Seltan, Lampung Utara	365000.00
Pulau BokorJakarta18.00Pulau RambutJakarta45.00Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30	DKI Jakarta	Depok (Pancoran Mas)	Kotip Depok	7.00
Pulau Rambut Muara AngkeJakarta45.00 25.02Jawa BaratCadas Malang SukawayanaCianjur Sukabumi21.00 30.50Telaga Patenggang Rawa DnauBandung Serang150.00 2500.00 7elaga Bodas2500.00 263.15 CibantengCibanteng Tangkuban Perahu(Pel. R.)Cianjur Sukabumi447.00 33.00 9.00Dungas Iwul Pananjung PangandaranSukabumi Ciamis9.00		Pulau Bokor	Jakarta	18.00
Muara AngkeJakarta25.02Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Pulau Rambut	Jakarta	45.00
Jawa BaratCadas MalangCianjur21.00SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Muara Angke	Jakarta	25.02
SukawayanaSukabumi30.50Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30	Jawa Barat	Cadas Malang	Cianjur	21.00
Telaga PatenggangBandung150.00Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Sukawayana	Sukabumi	30.50
Rawa DnauSerang2500.00Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Telaga Patenggang	Bandung	150.00
Telaga BodasGarut263.15CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Rawa Dnau	Serang	2500.00
CibantengCianjur447.00Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Telaga Bodas	Garut	263.15
Tangkuban Perahu(Pel. R.)Sukabumi33.00Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Cibanteng	Cianjur	447.00
Dungas IwulSukabumi9.00Pananjung PangandaranCiamis419.30		Tangkuban Perahu(Pel. R.)	Sukabumi	33.00
Pananjung Pangandaran Ciamis 419.30		Dungas Iwul	Sukabumi	9.00
		Pananjung Pangandaran	Ciamis	419.30
Rawa Cipanggang Ciamis 125.00		Rawa Cipanggang	Ciamis	125.00
Gunung Jagat Sumedang 126.70		Gunung Jagat	Sumedang	126.70
Yanlapa Bogor 32.00		Yanlapa	Bogor	32.00
Bojonglarang Jayanti Cianjur 750.00		Bojonglarang Jayanti	Cianjur	750.00
G. Tangkuban Perahu Bandung 1290.00		G. Tangkuban Perahu	Bandung	1290.00
Leuweung Sancang Garut 2157.00		Leuweung Sancang	Garut	2157.00
Gunung Tilu Bandung 8000.00		Gunung Tilu	Bandung	8000.00
G. Papandayan Garut 6620.00		G. Papandayan	Garut	6620.00
G. Burangrang Bandung 1700.00		G. Burangrang	Bandung	1700.00
Kawah Kamojang Bandng/Garut 7500.00		Kawah Kamojang	Bandng/Garut	7500.00
G. Tukung Gede Serang 1700.00		G. Tukung Gede	Serang	1700.00
Mega Mendung Cianjur 50.00		Mega Mendung	Cianjur Cianium/Bandung	50.00
Gunung Simpang Cianjur/Bandung 15000.00		Gunung Simpang	Clanjur/Bandung	15000.00
Telaga Warna Cianjur 368.25		Telaga Warna	Cianjur	368.25
Pulau Dua Serang 30.00		Pulau Dua Malahan		30.00
Malabar Bandung 8.30 Area Demos		Malabar	Bandung	8.30
Arta Dollias Clarijur 2.00 Cigontong Cinonii Bondung 10.00		Ai ca Dollias Cigontong Cinonii	Ciaiijui Bandung	2.00
Nusa Codo Danianu Ciamia 10.00		Nusa Coda Daniami	Ciamis	10.00
Takakak Cianjur 50.00		Takakak	Cianiur	10.00
Vunghun Dandung 950		Takukak Vunghun	Clangui Bandung	30.00 9 E0
Luighun Dahuung 2.30 Cikopub Sukohumi 9197.50		r uligiluli Cikopuh	Dalluulig Sukabumi	2.30 8197 FO
Cunung Sawal Ciamis 5400.00		Cupung Sawal	Ciamis	5400 00
Cunung Sawai Claims 3400.00 Cunung Masigit Karaumbi Sumadang/Carut 19490.70		Gunung Masigit Karaumhi	Sumodang/Carut	19400.00
Ir H Juanda Randung (Galut 12420.70		Ir H Juanda	Bandung	12420.70 500 00
G. Gede Pangrango Bogor, Sukabumi 15000.00	1		2 unung	000.00

Appendix 2.3.19 Continuation

Jawa Barat	Halimun	Bogor, Sukabumi	40000.00
	Ujung Kulon	Pandeglang	122956.00
	Linggarijati	Kuningan	11.51
	Situgnung	Sukabumi	100.00
	Telaga Bodas	Garut	23.85
	Pananjung Pangandaran	Ciamis	37.70
	Cimanggu	Bandung	154.00
	Carita	Pandegrang	95.00
	Gunung Papandayan	Garut	23.85
	Tangkuban Perahu	Bandung	370.00
	Kawah Kamojang	Garut	500.00
	Telga Warna	Bogor	5.00
	Telga Patenggang	Bandung	65.00
	Gunung Pancar	Bogor	447.00
	Sukawayana	Sukabumi	16.00
	Pulau Sangiang	Serang	1228.15
	Jember	Cianjur	50.00
	Gunung Tampomas	Sumedang	1250.00
Jawa Tengah	Ulo Lanang Kcubung	Batang	71.00
0	Curug Bengkawah	Pemalang	1.50
	Guci	Pemalang	2.00
	Moga	Pemalang	1.00
	Telogo Ranjeng	Pemalang	18.50
	Gebungan (Gn. Ungaaran)	Semarang	1.80
	Sepakung	Semarang	2.50
	Pringombo I/II	Banjarnegara	58.00
	Getas	Semarang	1.00
	Bantar Bolang	Pemalang	24.10
	Sub Vak 18c & 19b	Tegal	6.60
	Vak 50 Comal	Pemalang	24.10
	Pager Wunung Darupono	Kendal	30.00
	Karang Bolong	Cilacap	0.50
	Nusakambangan Timur	Cilacap	277.00
	Nusakambangan Barat	Cilacap	928.00
	Wijaya Kusama	Cilacap	1.00
	Telgo Dringo	Banjarnegara	26.10
	Telgo Sumurup	Banjarnegara	20.10
	Cabak		30.00
	Gunung Butak	Rembang	45.10
	Bekutuk	Bloa	25.00
	Gunung Celering	Jepara	1328.40
	Keling I/II/III	Jepara	65.80
	Grojogan Sewu	Karang Anyar	64.30
	Sumber Semen	Rembang	17.10
	Tuk Songo	Semarang	6.50
	Gunung Selok	Cilacap	126.20
	Telogowarno Pengilon	Wonosobo	39.60
	Peson Subah I/II	Batang	30.00
DI. Yogjakarta	Teluk Baron	Gunung Kidul	2.40
	Gunung Batu Gamping	Sleman	0.20
	Plawangan Turgo	Sleman	67.50
	Gunung Gamping	Sleman	1.10
	Plawangan Turgo	Sleman	131.00
Jawa Timur	Curah Manis Sempolan	Jember	16.80
	Manggis Gadungan	Kediri	12.00
	Panjur Ijen I/II	Bondowoso	9.00

Appendix 2.3.19. Continuation

Jawa Timur	Sungai Kolbu Iyang Plateau	Bondowoso	18.80
	Ceding	Bondowoso	50.40
	Nusa Barung	Jember	6100.00
	K. Ijen Merapi Ungup-Ungup	Banyubangi	2468.00
	Gunung Picis	Ponorogo	27.00
	Pulau Noko & P. Nusa	Surabaya (Bawean)	15.00
	Saobi (Kangean)	Sumenep (Madura)	430.00
	Pulau Sempu	Malang	877.00
	Gunung Sigogor	Ponorogo	190.50
	Gunung Abang	Pasuruan	50.40
	Pulau Bawean	Surabaya	725.00
	Gua Nglirip	Bojonegoro	3.00
	Besowo Gadungan	Kediri	7.00
	Dataran Tinggi Yang	Jember/Probolinggo	14145.00
	Bawean	Surabaya	3831.60
	R. Suruyo	Sidoarjo, Malang	25000.00
	Baluran	Panarukan	25000.00
	Bromo Tengger Semeru	Pasuruan, Probolinggo	50276.20
	Meru Betiri	Jember	58000.00
	Alas Puruwo	Banyuwangi	43420.00
	Tretes	Pasuruan	10.00
	Gunung Baung	Pasuruan	195.50
	K. Ijen Merapi Ungup-Ungup	Banyuangi	92.00
Bali	Batukahu I/II/III	Badung	1762.80
	Ngrah Rai	Jembrana/Buleleng	1373.50
	Bali Barat	Bangli	19002.89
	Panelokan	Bandung	540.00
	Sangeh	5	13969.00
Nusa Tenggara Barat	Tanah Pedauh	Sumbawa	543.50
	Dataran Bena	Timur Tengah	11000.00
	Tambora Seltan	Dompu	30000.00
	Pulau Moyo	Sumbawa	22250.00
	Gunung Rinjani	Lombok Barat	40000.00
	Suranadi	Lombok Tengah	52.00
	Pelangan	Lombok Tengah	500.00
	Kerandangan	Lombok Barat	320.00
	Bangko-Bangko		2169.00
	P. Satonda		2600.00
Nusa Tenggara Timur	Maubesi	Belu	1830.00
	Way Wuul/Mburak	Manggarai	3000.00
	Gunung Laanggaliru	Smba Timur	15638.84
	Watu Ata	Ngada	4898.80
	Wolo Tado Ngede Nalo	Ngada	4016.80
	Merah, Siung	U	
	Kateri	Belu	4560.00
	Harlu	Kupang	2000.00
	Danau Doudde	Kupang	500.00
	Perhalu	Kupang	1000.00
	Pulau Rusa	Alor	1500.00
	Pulau Ndano	Kupang	1562.00
	Prof. Ir. Herman Yohanes	Kupang	1900.00
	Kelimutu	Ende	5000.00
	Komodo	Manggarai	173300.00
		00 * *	
1	Manepau-Tanah Daru		87984.09
	Manepau-Tanah Daru Laiangi-Wanggameti		87984.09 47014.00

Appendix 2.3.19 Continuation

		a.1.1	
Nusa Tebggara Timui	Pulau Besar	Sikka	3000.00
	Manipo	Kupang	2499.50
	Ruteng	Manggarai	32248.60
Kalimantan Barat	Lo Pat Fun Pi	Sambas	8.00
	Mandor	Pontianak	2000.00
	Gunung Raya Pasi	Sambas	3700.00
	Gunung Nylut Perinsen	Pontianak/Sambas	180000.00
	Gunung Palung	Ketapang	90000.00
	Bentuang Karimun	Kapuas Hulu	800000.00
	Baning		315.00
	Gunung Kelam	Sintang	520.00
	Bukit Baka-Bukit-Raya	Sintang Kasongan	181090.00
	Danau Sentarum		129700.00
Kalimantan Tengah	Bakit Tangkiling	Palangkaraya	2061.00
	Pararawen I/II	Barito Utara	6200.00
	Bakit Sapat Hawung		239000.00
		1 /17	/6110.00
	Tanjung Putting	obar/Kotim	415240.00
	Bakit Tangkiling	Palangkaraya	533.00
Valimentar Caltar	Tanjung Keluang	akumai Davita Kasala	2000.00
Kalimantan Seltan	Pulau Kaget	Barito Kuala Liulu Sungoi Seleten	85.00
	Gunung Kentawan	Hulu Sungai Selatan	243.00
	Cupung Sebatung	Kota Baru	00050.00
	Disibari Tanah Laut	Kola Baru Tanah Laut	£30.00
	Fleinan I anan Laut	I dildii Ldut Donion Donu	112000.00
	Sultan Audin Dulau Kombang	Dalijai Dalu Barita Kuala	60.00
	I ulau Kelibalig Dlaibari	Dalito Kuala Disibarii	1500.00
-		FIEIDALD	
Kalimantan Timur	Muara Kaman Sedulang	Kutai	62500.00
Kalimantan Timur	Muara Kaman Sedulang	Kutai	62500.00
Kalimantan Timur	Muara Kaman Sedulang Padang Luwai	Kutai Kutai	62500.00 5000.00 46900.00
Kalimantan Timur	Muara Kaman Sedulang Padang Luwai Amper Kutai	Kutai Kutai	62500.00 5000.00 46900.00 198629.00
Kalimantan Timur	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang	Kutai Kutai Kutai Bulungan	$\begin{array}{r} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\end{array}$
Kalimantan Timur	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto	Kutai Kutai Kutai Bulungan Samarinda	$\begin{array}{r} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Ponaya Raja	Kutai Kutai Kutai Bulungan Samarinda Gorontalo	$\begin{array}{r} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow	$\begin{array}{r} 1360.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung	$\begin{array}{r} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ 4299.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ 4299.00\\ 3196.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 45000.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado	$\begin{array}{r} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Minahasa	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel.	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Minahasa Sangir-Talaud	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Minahasa Sangir-Talaud Bolaang M. Gorontalo	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 425000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\end{array}$
Kalimantan Timur Sulawesi Utara	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Gorontalo Manado Minahasa Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 425000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Poso	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Poso Poso	$\begin{array}{r} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Poso Poso	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang <u>Bukit Soeharto</u> Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga Pati-Pati	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Poso Poso Poso Banggai	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 160.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ 3500.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga Pati-Pati Lombuyan I/II	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Poso Poso Poso Banggai Banggai	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ 3500.00\\ 3500.00\\ 3665.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga Pati-Pati Lombuyan I/II Dolangan	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Bitung Poso Poso Poso Banggai Banggai Buol Toli-Toli	$\begin{array}{c} 1360.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ 3500.00\\ 3665.00\\ 462.50\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga Pati-Pati Lombuyan I/II Dolangan Bakiringan	Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Poso Poso Poso Banggai Banggai Buol Toli-Toli	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 45000.00\\ 112.50\\ 100.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ 3500.00\\ 3665.00\\ 462.50\\ 12500.00\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga Pati-Pati Lombuyan I/II Dolangan Bakiringan Pinjam/Tanjung Matop	Kutai Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Bitung Poso Poso Poso Banggai Banggai Buol Toli-Toli	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 42500.00\\ 21400.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ 3500.00\\ 3500.00\\ 3665.00\\ 462.50\\ 12500.00\\ 1612.50\\ \end{array}$
Kalimantan Timur Sulawesi Utara Sulawesi Tengah	Muara Kaman Sedulang Padang Luwai Amper Kutai Kayan Mentarang Bukit Soeharto Mas Popaya Raja Gunung Ambang Dua Saudara Tangkoko Batuangus Panua Tanggale Gunung Lokon Gunung Manembo-nembo Karakelang Utara dan Sel. Bogani Nani Wartabone Batu Angus Batu Putih Tanjung Api Morowali Pangi Binanga Pati-Pati Lombuyan I/II Dolangan Bakiringan Pinjam/Tanjung Matop Palu	Kutai Kutai Kutai Kutai Bulungan Samarinda Gorontalo Bolaang Mangondow Manado/Biung Manado/Biung Gorontalo Manado Minahasa Sangir-Talaud Bolaang M. Gorontalo Bitung Bitung Bitung Poso Poso Poso Banggai Banggai Buol Toli-Toli Donggala	$\begin{array}{c} 1300.00\\ 62500.00\\ 5000.00\\ 46900.00\\ 198629.00\\ 1360500.00\\ 61850.00\\ 61850.00\\ 8638.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 4299.00\\ 3196.00\\ 4290.00\\ 6500.00\\ 21400.00\\ 287115.00\\ 635.00\\ 615.00\\ 4246.00\\ 225000.00\\ 6000.00\\ 3500.00\\ 3665.00\\ 462.50\\ 12500.00\\ 1612.50\\ 8100.00\\ \end{array}$

Appendix 2.3.19 Continuation

Sulawesi Tengah	Air Teriun Wera	Dongara	250.00
Suluivosi Ionguli	Landusa Tomata	2019010	5000.00
Sulawesi Selatan	Karsenta	Luwu	1000.00
	Pegunungan Faruhumpenai	Luwu	90000.00
	Bulu Saraung	Maros	5690.00
	Bantumurung	Maros	1000.00
	Kalaena	Luwu	110.00
	Ponda-Ponda	Tana Toraja	80.00
	Lampoko Mampie	Polewali	2000.00
	Bonto Bahari	Bulukumba	4000.00
	Komara	Takalar	3390.00
	Komara	Takalar	4610.00
	Danau Matano	Luwuk	30000.00
	Danau Towuti	Luwuk	65000.00
	Bantimurung	Maros	18.00
	Goa Patunuang	Maros	1500.00
	Malino	Gowa	3500.00
	Sidrap	Sidrap	500.00
	Nanggara III	Luwu	500.00
	Cani Sirenrang	Bone	3125.00
	Lejja	Sopeng	1265.00
Sulawesi Tenggara	Napabalano	Muna	9.00
	Lamedae	Kolaka	500.00
	Tanjung Amelengo	Kendari	850.00
	Buton Utara	Muna	82000.00
	Tanjung Batikolo	Kendari	5500.00
	Tanjung Peropa	Kendari	38000.00
	Murhum	Kendari	8146.00
	Rawa Aopa Watumohai	Kendari/Kolaka	105194.00
	Mangolo		5200.00
	Tirta Rimba	Buton	500.00
	Padang Mata Osu		8000.00
Maluku	Gunung Api Kisar	Maluku Tengah	80.00
	Piulau Seho	Maluku Utara	1250.00
	Pulau Angwarmase	Maluku Tenggara	800.00
	Pulau Nustaram	Maluku Tenggara	3200.00
	Pulau Nuswotar	Maluku Tenggara	7500.00
	Masbait		6250.00
	Gunung Sibela		23024.00
	Daab	Maluku Tenggara	14218.00
	Pulau Larat		4505.00
	Lifamatora		1690.53
	Pulau Pombo	Maluku Tengah	2.00
	Pulau Baum	Mauku Tenggara	13000.00
	Pulau Kassa	Maluku Tengah	900.00
	Pulau Manuk	Maluku Tengah Maladar Ta	100.00
	Manusela	Maluku Tengah	189000.00
т. т. т.	Gunung Api Banda	Maluku Tengah	734.46
Irian Jaya	Pegunungan Cycloop	Jayapura Nabina	22500.00
	Enarotali Dulau Waitta Da	INabire Senera	300000.00
	Pulau walgeo Barat	Sorong	10000.00
	Dalanta Barat	Solong	10000.00 60205 00
	Ariak Solowoti Utoro	Jayapura	57000.00
	Salawali Utara Diak Litana	Diale	57000.00
	Diak Utara Tamrau Utara	DIAK	11000.00
	raillau Utara		000000.00

Irian Jaya	Yapen Tengah	Yapen Waropen	59000.00
	Pulau Supriori	Teluk Cendrawasih	42000.00
	Misool Seltan	Sorong	84000.00
	Wondi Boy	Yapen Waropen	73022.00
	Pulau Waigeo Timur	Sorong	119500.00
	Pulau Dolok	Merauke	600000.00
	Jayawijaya	Jayawijaya	800000.00
	Foja	Jayapura	1018000.00
	Danau Bian		69390.00
	Lorentz	Fakfak/Merauke	2505600.00
	Wasur	Merauke	418810.00
	Gunung Meja	Manokwari	460.25
	Nabire	Nabire	100.00
	Sorong	Sorong	945.00
	Beriat	-	9193.75
	Klamono	Sorong	1909.37
	Teluk Yotafa	Jayapura	1650.00

Appendix 2.3.19. Continuation

Source : Forest Protection and Nature Conservation Statistics

Year	Mamal	Aves	Reptilia	Pices	Insect	Crustacea	Molusca	Total
1988/89	95	372	28	6	20		15	536
1989/90	95	372	28	6	20		15	536
1990/91	95	372	28	6	20		15	536
1991/92	95	372	28	6	20		15	536
1992/93	95	372	30	6	20		15	538
1993/94	95	379	30	6	20	3	13	546
1994/95	95	379	30	6	20	3	13	546
1995/96	95	379	30	6	20	3	13	546
1996/97	95	379	30	6	20	3	13	546
1997/98	95	379	30	6	20	3	13	546

Appendix 2.3.20. Protected of Species Fauna for the Last 10 Years

Source : Statistics Forestry and Estate Crops of Indonesia

Appendix 2.3.21. List of Protected Mamal in Indonesia,1998

Species	Indonesia Name
Anoa depressicomis	Anoa daratan rendah, Kerbau pendek
Anoa quarlesi	Anoa pegunungan
Aricitis binturong	Bintung
Arctonyx collaris	Pulusan
Babyrousa babyrussa	Babirusa
Balaenoptera musculus	Paus Biru
Balaenoptera physalus	Paus bersirip
Bos sondaicus	Banteng
Capricomis sumatrensis	Kambing Sumatera
Servus kuhli:axis kuhli	Rusa bawean
Servus spp	Menjangan, Rusa, Samber(Semua jenis dari Cervus)
Cetacea	Paus (Sema jenis dari famili Celacea)
Cuon alpinus	Ajag
Cynocephalus variegatus	Kubung, Tando, Walangkekes
Cynogale bennetti	Musang Air
Cynopithecus niger	Monyet hitam Sulawesi
Dendrolagus spp	Kanguru pohon(semua jenis dari famili Dendrolagus)
Dicororhinus sumatrensis	Badak Sumatera
Dolphinidae	Lumba-lumba air laut(semua jenis dari famili Dolphinidae)
Dugon-dugon	Duyung
Elephas indicus	Gajah
Felis badia	Kucing merah
Felis bengalensis	Kucing hutan,Meong cengkokmerah
Felis marumorota	Kuwuk
Felis Planiceps	Kucing dampak
Felis temmincki	Kucing emas
Felis viverrinus	Kucing bakau
Helarctos malayanus	Beruang madu
Hylobatidae	Owa, kera tak berbuntut(semua jenis dari famili Hylobatidae)
Hystrix brachyura	Landak
Lomys hosei	Bajing terbang ekor merah
Lariscus hosei	Bajing tanah bergaris
Lariscus insignis	Bajing tanah, Tupai tanah
Lutra lutra	Lutra
Lutra sumatrana	Lutra Sumatera
Macaca brunnescens	Monyet Sulawesi
Macaca maura	Monyet Sulawesi
Macaca pagensis	Bokoi, Beruk mentawai
Macaca tonkeana	Monyet jambul
Macrogalidea musschenbrox	Musang sulawesi
Manis Javanica	Trenggiling, peusing
Magaptera nevaeangliac	Paus bongkok
Muntiacus muntjak	Kidang, Muncak
Mydaus jarvatus	Sigung
Nasalis larvatus	Kahau, Bekantan
Neovelis nebulusa	Harimau dahan
Nesolagus netscheri	Kelinci sumatera
INYCTICEDUS COUCANG	Maiu-maiu
Urcaella brevirostris	Lumba-lumba air tawar, Pesut
Panthera tigris sondaica	Macan kumbang, Macan tutul
Paninera tigris sumatrae	Harimau jawa
Petaurista elegans	Cukubo, Bajing terbang
Phalanger spp	Kuskus(semua jenis dari genus phalanger)
Pongo pygmaeus	Orang utan, Mawas

Appendix 2.3.21 Continuation

	T 1 1 4
Presbitys frontana	Lutung dahi putih
Presbitys rubicunda	Lutung merah, Kelasi
Presbitys aygula	Surili
Presbitys potenziani	Joja, Lutung mentawai
Presbitys thomasi	Rungka
Prionodon linsang	Musang congkok
Procidona bruijni	Landak irian, Landak semut
Ratufa bicolor	Jelarang
Rhinoceros sondaicus	Badak jawa
Simias concolor	Simpei mentawei
Tapirus indicus	Tapir,Cipan, Tenuk
Tarucius spp	Bianatang hantu, Singapuar(semua jenis dari genus Tarsius)
Thylogale spp	Kanguru tanah(semua jenis dari genus Thylogale)
Tragulus spp	Kancil,Pelanduk, Napu(semua jenis dari genus Tragulus)
Ziphiidae	Lumba-lumba air laut(semua jenis dari famili Ziphiidae)

Source : Nature Conservation Statistics, 1998/1999

Appendix 2.3.22. List of Protected Aves in Indonesia, 1998

Species	Indonesia Name
Accinitridae	Burung alap-alap. Flang(semua jenis dari famili Accintridae)
Aethonyga exima	Iantigan gunung
Aethoyga duwonhodoi	Burung gunung
Alcedinidae	Burung Madu Sangibe
Alcinne nyrrhontera	Durung Madu Dangine
Andringe melonogester	Burung Odang, kaja udang (semua jenis dari famili Alcedimidae)
Anninga metanogaster	Drencetwegan Decuk uler
	Mondor Sulowesi
Algustalius algus	
Dubuicus Ibis Pucaravidaa	Kudu Kuntul Pangau nutih
Coostuo golorito	
	Julang, Enggang, Rangkong(semua jenis dari famili Bucerotidae)
Cacatua gomini	Kakatua gofin
	Kakatua seram
Cacatua sulphurea	Kakatua kecil jambul kuning
Cairina scuturata	Itik liar
Caloenas nicobarica	Junai, Burung mas, Minata
Casuarius benneti	Kasuari Kecil
Casuarius casuariusenneti	Kasuari Kecil
Casuarius unappenddiculatus	Kasuari gelambir satu, Kasuari leher kunung
Ciconia episcopus	Bangau hitam, Sandanglawe
Colluricincla megarphyncha sanghi	Burung sohabe coklat
Crosias albonotatus -rensis	Burung matahari
Ducla whartoni	Pergam raja
Egretta sacra	Kuntul karang
Egretta spp	Kuntul , Bangau putih(semua jenis dari genus Egretta)
Elanus caerulleus	Alap-alap putih, Alap-alap tikus
Elaus hypoleucus	Alap-alap putih, Alap-alap tikus
Eos histrio	Nuri sangir
Esacus magnorostris	Wili-wili, Ular, bebek laut
Eutrichomyas rowleyi	Seriwang sangihe
Falconidae	Burung Alap-alap, Elang(semua jenis dari famili Falconidae)
Fregeta andrewsi	Burung gunting, Bintayung
Garruax rufifrons	Burung kuda
Goura spp	Burung dara mahkota,Burung titi,Mabruk(semua jenis Goura)
Gracula religiosa mertensi	Beo flores
Gracula religiosa robusta	Beo Nias
Gracula religiosa venerata	Beo sumbawa
Grus spp	Jening (semua jenis dari genus grus)
Homantopus himantopus	Trulek lidi, Limbo
Ibis Cinereus	Bluwok, Walangkadak
Ibis leucocephala	Bulwok berwarna
Lorius roratus	Bayan
Leptoptilos Javanicus	Marabu, Bangau tontong
Leucopasar rothschildi	Jalak bali
Limnodromus semipalmatus	Blekek asia
Lophozosterops javanica	Burung kaca mata leher abu-abu
Loohura bulweri	Beleang ekor putih
Loriculus catamene	Serndit Sangihe
Lorius domocellus	Seriwang Sulawesi
Macrocephalon maleo	Nori merah kepala hitam
Mehalaima corvina	Burung maleo
Mehalaima jvensis	Cangcarang
Megapodiidae	Haruku, ketuk-ketuk
Megapodius reintwardtii	Tulung tumpuk, Bultok jawa
Appendix 2.3.22 Continuation

Meliphagidae	Maleo. Burung Gosong(semua jenis dari famili Megapodiidae)
Musciscapa nuecki	Burung gesong
Mycteria cinerea	Burung sesap, pengisap madu(semua jenis dari famili Nectariniidae)
Nectariniidae	Gagajahan(semua jenis dari genus Nurumenius)
Numenius spp	Kowak merah
Nycticorax caledoicus	Burung hantu biakkipas biru
Ptus migicus beccarii	Burung Alap-alap, Elang(semua jenis dari famili pandionidae)
Pandisenidae	Burung Cendrawasih(semua jenis dari famili paradiseidae)
Pavo Muticus	Burung merak
Pelecanidae	Gangsa laut(semua jenis dari famili pelecanidae)
Pittidae	Burung paok, Burung cacing(semua jenis dari famili pittidae)
Plegadis falcinellus	Ibis hitam, roko-roko
Polyplectron maacense	Merak kerdil
Probosciger aterrinus	Kakatua raja, Kakatua hitam
Psaitria exillis	Glatik kecil, Glatik gunung
Pseudibias davisoni	Ibis hitam, punggung putih
Psitichas fulgudus	Kasturi raja, Betet besar
Ptilonorhynchidae	Burung namdur, Burung dewata
Rhipidura euryura	Burung kpas perut putih, kipas gunung
Rhipidura Javanica	Burung kipas
Rhipidura phoenicura	Burung kipas ekor merah
Satchyris grammiceps	Burung tepus data putih
Satchyris melanothorax	Burung tepus pipi perak
Sterna zimmermanni	Dara laut berjambul(semua jenis dari famili sternidae)
Sternidae	Dara dara laut(semua jenis dari famili sternidae)
Sturunus melanopterus	Jalak putih, kaleng putih
Sula abbotti	Gabgsa batu aboti
Sula dactylatra	Gangsa batu muka biru
Sula leucogaster	Gangsa batu
Sula-sula	Gangsa batu kaki merah
Tanygnathus sumatranus	Nuri Sulawesi
Threskiomis aethiopicus	Ibis putih, paltuk besi
Trichoglossus omatus	Kasturi Sulawesi
Tringa guttifer	Trinul tutul
Trogonidae	Kasumba, surku, Burung luntur
Vanellus macropterus	Trulek ekor putih

Source : Forest Protection and Nature Consevation Statistics, 1998/1999

Species	Indonesia Name
Batagur baksa	Tuntong
Caretta caretta	Penyu tempayan
Carettochyelys inscupta	Kura-kura Irian
Chelodina novaeguineae	Kula Irian leher panjang
Chelonia mydas	Penyu hijau
Chitra indica	Labi-labi besar
Chlamydosaurus kingii	Soa payung
Chondrophyton viridis	Sanca hujau
Crocodylus novaegiuneae	Buaya air tawar Irian
Crocodylus porosus	Buaya muara
Crocodylus siamensis	Buaya siam
Dermochelys coriacea	Penyu belimbing
Elseya novaeguineae	Kura irian leher pendek
Eretmochelys imbricata	Penyu sisik
Gonychephalus dilophus	Bunglon sisir
Hydrasaurus amboinensis	Soa-soa, Biawak ambon, Biawak pohon
Lepidochelys olivacae	Penyu ridel
Natator depressa	Penyu pipih
Orlitia ornneensis	Kula-kula gading
Python molurus	Sanca bodo
Python timorensis	Sanca timur
Tiliqua gigas	Kadal panama
Tomistoma achlegelii	Senyulong, Buaya sapit
Varanus bomeensis	Biawak kalimantan
Varanus gouldibomeensis	Biawak coklat
Varanus indicus	Biawak maluku
Varanus komodoensis	Biawak komodo, Ora
Varanus nebulosus	Biawak abu-abu
Varanus prasinus	Biawak hijau
Varanus timorensis	Biawak timor
Varanus togianus	Biawak togian

Appendix 2.3.23. List of Protected Reptilians in Indonesia, 1999

Source : Forest Protection and Nature Conservation Statistics, 1998/1999

Appendix 2.3.24. List of Protected Orchidaceae, Dipterocarpaceae, Bivalvia Pisces and Palmae in Indonesia, 1999

Species	Indonesia Name
Orchidaceae	
Ascocentrum miniatun	Anggerek kebutan
Coelogyne pandurata	Anggerek hitam
Corvbas fomicatus	Anggerek koribas
Cymbidium hartinahianum	Anggerek hartnah
Dedrobium catinecloesum	Anggerek karawai
Dendrobium d'albertisii	Anggerek albert
Dendrobium lasianthera	Anggerek stuberi
Dendrobium macrophyllum	Anggerek jamrud
Dendrobium ostrinoglossum	Anggerek karawai
Dendrobium phalaenopsis	Anggerek larat
Grammatophyllum papuanum	Anggerek raksasa irian
Grammatophyllum speciosum	Anggerek tebu
Macodes petola	Anggerek ki aksara
Paphiopedilum chamberlainianum	Anggerek kasut kumis
Paphiopedilum glaucophyllum	Anggerek kasut berbulu
Paphiopedilum paraestans	Anggerek kasut pita
Paraphalaenopsis denevei	Anggerek bulan bintang
Paraphalaenopsis lavcokii	Anggerek bulan kalimantan tengah
Paraphalaenopsis serpentilingua	Anggerek bulankalimantan barat
Phalaenopsis amboinensis	Anggerek bulan ambon
Phalaenopsis gigantea	Anggerek bulan raksasa
Phalaenopsis sumaterana	Anggerek bulan sumatera
Phalaenopsis violacose	Anggerek kelip
Renanthera matutuna	Anggerek jingga
Sparthoglottis zurea	Anggerek sendok
Vanda celebica	Vanda mungil minahasa
Vanda hookerna	Vanda pensil
Vanda pumila	Vanda mini
Vanda sumaterana	Vanda sumatera
Nephentaceae	
Nehentes spp	Kantong semar(semua jenis dari genus Nephentes)
Dipterocarpaceae	
Shorea stenopten	Tengkawang
Shorea stenoptera	Tengkawang
Shorea gysberstiana	Tengkawang
Shorea pinanga	Tengkawang
Shorea compressa	Tengkawang
Shorea seminis	Tengkawang
Shorea martiniana	Tengkawang
Shorea mexistopteryx	Tengkawang
Shorea beccariana	Tengkawang
Shorea micrantha	Tengkawang
Shorea palembanica	Tengkawang
Shorea lepidota	Tengkawang
Shorea singkawang	Tengkawang
Bivalvia	
Birgus latro	Ketam kelapa
Cassis comuta	Kepla kambing
Charonia tritomnis	Triton terompet
Hippopus hippopus	Kima tapak kuda, Kima kuku benang
Hippopus p0rcellanushippopus	Kima cina
Nautilias pompillius	Nautilus berongga
Tachiplues gigas	Ketam tapak kuda

Appenuix 2.3.24. Continuation	
Tridacna derasa	Kima seltan
Tridacna gigas	Kima raksasa
Tridacna maxima	Kima kecil
Tridacna squamosa	Kima sisik, Kima seruling
Tridacna niloticus	Troka, susur bundar
Turbo marmoratus	Batu laga, Siput hijau
Pisces	
Homaloptera gymmnogaster	Selusur maninjau
Latimeria chalumnae	Ikan raja laut
Notopterus spp	Belida jawa,lopis jawa(semua jenis dari genus Notopterus)
Pritis spp	Pari sentani, Hiu sentani(semua jenis dari genus Pritis)
Puntius microps	Wader goa
Scleropages formosus	Peyang malaya, Tangkelasa
Scleropages jardini	Arowana irian, peyang irian, Kaloso
Anthozoa	
Antiphates spp	Akar bahar,Koral hitmam(semua jenis dari genus Antiphates)
Rafflessiacea	
Raffllesia spp	Rafflesia, Bunga padma(semua jenis dari genus Rafflesia)
Palmae	
Amorphophallus decussilva	Bunga bangkai jakung
Amorphophallus titanum	Bunga bangkai rakasa
Borrassodendron bomcensis	Bidang, Budang
Caryota no	Palm raja/Indonesia
Ceratolobus glaucescens	Palm jawa
Cystostachys lakka	Pinang merah kalimantan
Cystostachys ronda	Pinang merah bangka
Eugeissona utilitis	Bertan
Johanneste ijsmaria altifrons	Daun payung
Livistona spp	Palem kipas Sumatera(semua jenis dari genus Livistona)
Nenga gajah	Palem Sumatera
Phenix paludosa	Korma rawa
Pigafatta filaris	Manga
Pinanga javana	Pinang Jawa

Appendix 2.3.24. Continuation

Source : Forest Protection and Nature Conservation Statistics, 1998/1999

Species	Indonesia Name				
Cethosia myrina	Kupu bidadari				
Omithoptera	Kupu sayap burung peri				
Omithoptera	Kupu sayap burung				
Omithoptera	Kupu sayap burung				
Omithoptera	Kupu burung priamus				
Omithoptera	Kupu burung rotsil				
Omithoptera	Kupu burung tiron				
Trogonotera	Kupu trogon				
Triodes amphrysus	Kupu raja				
Triodes andromanche	Kupu raja				
Triodes criton	Kupu raja				
Triodes haliphron	Kupu raja				
Triodes helena	Kupu raja				
Triodes hypolitus	Kupu raja				
Triodes meoris	Kupu raja				
Triodes miranda	Kupu raja				
Triodes plato	Kupu raja				
Triodes rhadamantus	Kupu raja				
Triodes ideri	Kupu raja				
Triodes	Kupu raja				

Appendix 2.3.25. List of Protected Insects in Indonesia, 1999

Source : Forest Protection and Nature Conservation Statistics,

(Ton/Year)						
Province/Island	Dust	SO2	NO2	HC	CO	CO2
Daerah Istimewa Aceh						
Sumatera Utara	568602.00	970958.00	424.00	20429.00	13765.00	10154.00
Sumatera Barat	32339.00		10516.00			74.00
Riau	4189.00	56.00	954.00	203227.00		
Jambi	2435678.00	0.00	707.00	0.00	0.00	0.00
Sumatera Seltan						
Benkulu	2951.00	0.00	21.00	6.00	0.00	39.00
Lampung						
DKI Jakarta	18384.00	3718.00	82.00	3382.00	98600.00	0.00
Jawa Barat	188542132.00	1230417.00	239447.00	115911.00	4754611.00	844463.00
Jawa Tengah	571668.00	6412.00	1952.00	2096.00	288288.00	6114.00
D.I. Yogyakarta	119512.00	0.00	0.00	112.00	0.00	132.00
Jawa Timur	394394.00	35891.00	3197163.00	2416549.00	108219.00	1721186.00
Bali						
Nusa Tenggara Barat	0.00	0.00	0.00	0.00	0.00	0.00
Nusa Tenggara Timur	0.00	0.00	0.00	0.00	0.00	181980.00
Kalimantan Barat						
Kalimantan Tengah						
Kalimantan Selatan						
Kalimantan Timur	1.44	0.46				
Sulawesi Utara						
Sulawesi Tengah						
Sulawesi Selatan	53.00	1.00	7.00	1.00	9.00	3657.00
Sulawesi Tenggara						
Maluku	0.00	0.00	8292.00	389.00	0.00	700000.00
Irian Jaya	697640236.00	0.00	427784.00	0.00	0.00	10732445.00

Appendix 2.3.26. Air Pollution Load from manufacturing Industry by Province, 1998

Source : Rapid Assessment of Air, Water and Land population, Based oh WHO Publication No.62

Province	Source Kind	Dust	SO2	NO2	HC	СО	CO2
Sumatera Utara	Electric Power	15.00		192.00	2.00	10	42807.00
	Industry Stove	235.00		614.00	30.00	43.00	257965.00
	Domestic Stove	1831.00		1407.00	244.00	154.00	1926830.00
Sumatera Barat	Electric Power	1716.00	1156.00	547.00	23.00	122.00	588689.00
	Industry Stove	688.00	1054.00	408.00	27.00	47.00	145.00
	Domestic Stove	424.00	2492.00	331.00	56.00	35.00	441792.00
Riau	Electric Power	204.00	1.95	2.60	0.00	0.10	579.10
	Industry Stove	57.00	0.10	0.20	0.00	0.00	84.00
	Domestic Stove	14477.00	1.00	5.50	1.10	1.10	2037.00
Jambi	Electric Power	5064960.00	350326386.00	202598392.00	337664.00	5698080.00	58035997718.00
	Industry Stove						
	Domestic Stove	2498.00	41991.00	2152.00	449.00	781.00	6840520.00
Benkulu	Electric Power	11.00	216.00	144.00	1.00	7.00	321134.00
	Industry Stove	0.00	0.00	0.00	0.00	0.00	0.00
	Domestic Stove	391.00	424.00	173.00	33.00	30.00	114916.00
DKI Jakarta	Electric Power	38664.00	12972.00	57960.00	418.00	2294.00	14691250.00
	Industry Stove	39644.00	2473.00	159962.00	4104.00	21129.00	331052550.00
	Domestic Stove	2003.00	62.00	7724.00	735.00	1850.00	22860143.00
Jawa Tengah	Electric Power	913.00	17470.00	11589.00	114.00	579.00	2589902.00
	Industry Stove	2062.00	13412.00	5023.00	286.00	477.00	2012746.00
	Domestic Stove	1842.00	11477.00	1488.00	251.00	174.00	2065011.00
Jawa Timur	Electric Power	70162457.00	5038491.00	5624561.00	82146.00	302830.00	1436673344.00
	Industry Stove	821341.00	3012791.00	1189685.00	56276.00	97253.00	606345450.00
	Domestic Stove	302609.00	2530261.00	361990.00	265985.00	1206551.00	428737267.00
Nusa Tenggara Bara	Electric Power	0.00	0.00	0.00	0.00	0	0.00
	Industry Stove	0.00	0.00	0.00	0.00	0.00	0.00
	Domestic Stove	0.00	0.00	0.00	0.00	0.00	0.00
Kalimantan Selatan	Electric Power						
	Industry Stove						
	Domestic Stove						
Kalimantan Timur	Electric Power	0.33	6.3	4.19	0.04	0.21	
	Industry Stove						
	Domestic Stove	0.62	3.54	0.08	0.08	0.05	

Appendix 2.3.27. Air Pollution Load from Constant Source (Fuel Consumption) by Province, 1998 (Ton/Year)

Sulawesi Selatan	Electric Power	4	7	0.6	4	16	22
	Industry Stove	2	20	4	0	0	1658
	Domestic Stove	1	7	1	0	0	1416
Maluku	Electric Power	89	150897	1125	11	56	251340
	Industry Stove	0	0	0	0	0	0
	Domestic Stove	150	127500	115	20	13	157500

Appendix 2.3.27. Continuation

Source : Regional Environmental Impact Management Agency, 1998 Balance of Regional Enironment Quality

			,	(Ton/Year)		
Province/Island	Dust	SO2	NO2	HC	СО	CO2
Daerah Istimewa Aceh			· · ·			
Sumatera Utara	2848.00	1881897.00	1577342.00	963519.00	22599535.00	462410344.00
Sumatera Barat	305.00	0.00	1466.00	1067.00	25888.00	431842.00
Riau	26.00	72.00	81.00	52.00	76.00	3146.00
Jambi	336.00	860.00	1521.00	1549.00	35723.00	10474.00
Sumatera Seltan	'	/	4	1		
Benkulu	179.00	602.00	875.00	840.00	20981.00	258821.00
Lampung	'	/	· ·	· · · · · · · · · · · · · · · · · · ·		313436666.00
DKI Jakarta	12594.00	17357.00	61836.00	58465.00	1451867.00	18260144.00
Jawa Barat	818747.00	636803.00	8278440.00	14919387.00	170299341.00	
Jawa Tengah	4322.00	55979.00	22392.00	15856.00	381754.00	6457081.00
D.I. Yogyakarta	'	54.00	5094.00	8047.00	170258.00	15678992.00
Jawa Timur	16288.00	33116.00	74671.00	67725.00	784617.00	9679884.00
Bali	'	/	4	1		
Nusa Tenggara Barat	0.00	0.00	0.00	0.00	0.00	0.00
Nusa Tenggara Timur	'	/	 '	· · · · · · · · · · · · · · · · · · ·		1
Kalimantan Barat	'	/	 '	1		
Kalimantan Tengah	'	/	4			
Kalimantan Selatan	'	/	4	1		
Kalimantan Timur	0.78	3.80	2.41	2.41	7.84	
Sulawesi Utara	'	/	4	1		
Sulawesi Tengah	'	/	 '	· · · · · · · · · · · · · · · · · · ·		1
Sulawesi Selatan	9.00	50.00	40.00	68.00	186.00	655.00
Sulawesi Tenggara	'	/	4			
Maluku	2024.00	8739.00	8742.00	59242.00	1138724.00	2156604.00
Irian Jaya	'	/	 '	1	1	

Appendix 2.3.28. Air Pollution Load from Mobile Source (Fuel Consumption) by Province, 1997

Source : Rapid Assessment of Air, Water and Land population, Based oh WHO Publication No.62

				(Ion/Year)	
Province/Island	Passenger Cars	Buses	Trucks	Motor Cycles	Total
Daerah Istimewa Aceh	1013.73	132.59	1118.72	11068.59	13333.64
Sumatera Utara	8270.98	1520.62	6882.88	47369.79	64044.27
Sumatera Barat	1294.11	1619.81	2251.21	10440.30	15605.44
Riau	2421.52	1152.54	2177.29	18764.79	24516.14
Jambi (1997)	667.32	159.71	588.36	5127.85	6543.24
Sumatera Seltan	7341.47	1343.98	6853.85	37872.11	53411.40
Benkulu (1997)	571.60	29.80	499.65	2378.60	3479.66
Lampung (1997)	2026.08	184.91	2210.63	9681.76	14103.38
DKI Jakarta	66113.81	18644.65	22895.37	124887.53	232541.37
Jawa Barat	17867.47	4961.97	10245.94	61981.74	95059.12
Jawa Tengah	18398.69	1997.83	13345.85	152057.81	185800.17
D.I. Yogyakarta (1997)	3265.60	350.54	1466.63	25642.05	30724.82
Jawa Timur	22263.13	669.77	12816.68	150886.77	186636.36
Bali	5966.67	967.67	3982.79	41747.80	52666.92
Nusa Tenggara Barat (1997)	717.18	196.70	830.26	6404.18	8148.32
Nusa Tenggara Timur (1997)	401.72	368.38	499.05	2893.39	4162.54
Kalimantan Barat	1154.58	184.19	919.33	11997.02	14135.40
Kalimantan Tengah (1997)	324.38	162.22	324.80	5112.04	5923.45
Kalimantan Selatan	1993.16	519.05	1884.39	19671.37	24064.98
Kalimantan Timur	1993.10	627.81	1951.97	20466.97	25039.86
Sulawesi Utara	2097.43	921.72	2314.43	11557.23	16890.82
Sulawesi Tengah (1997)	625.66	242.55	1078.92	7596.47	9543.60
Sulawesi Selatan	3722.15	1451.49	2787.20	34167.67	42128.51
Sulawesi Tenggara (1997)	118.58	348.21	334.56	1912.11	2713.45
Maluku	869.53	173.41	653.61	2516.87	4213.43
Irian Jaya	919.75	543.17	573.16	3857.02	5893.10
Indonesia	163703.27	37434.29	93651.69	761311.39	1056100.64

Appendi 2.3.29. Estimate of HC Emission from Motorized Vehicle by Province / Island and Type of Vehicle

Source : Rapid Assessment of Air, Water and Land population, Based oh WHO Publicatio

				I on / Year	
Province/Island	Passenger Cars	Buses	Trucks	Motor Cycles	Total
Daerah Istimewa Aceh	562.50	73.57	620.76	6141.72	7398.54
Sumatera Utara	4589.38	843.76	3819.16	26284.46	35536.76
Sumatera Barat	718.08	898.80	1249.15	5793.09	8659.12
Riau	1343.65	639.52	1208.13	10412.17	13603.47
Jambi (1997)	370.28	88.62	326.47	2845.33	3630.70
Sumatera Seltan	4073.62	745.74	3803.05	21014.40	29636.81
Benkulu (1997)	317.17	16.54	277.25	1319.83	1930.79
Lampung (1997)	1124.23	102.60	1226.63	5372.19	7825.65
DKI Jakarta	36685.10	10345.51	12704.14	69297.35	129032.10
Jawa Barat	9915.38	2753.29	5685.25	34392.31	52746.22
Jawa Tengah	10209.03	1108.55	7405.32	84373.54	103096.44
D.I. Yogyakarta (1997)	1812.01	194.51	813.80	14226.21	17048.53
Jawa Timur	12353.32	371.64	7111.70	83723.76	103560.42
Bali	3310.77	538.05	2209.96	23164.94	29223.72
Nusa Tenggara Barat (1997)	397.95	109.14	460.69	3553.54	4521.33
Nusa Tenggara Timur (1997)	222.91	204.41	276.91	1605.48	2309.70
Kalimantan Barat	640.65	102.20	510.12	6656.88	7843.42
Kalimantan Tengah (1997)	162.06	68.66	147.31	2338.83	2716.85
Kalimantan Selatan	1105.96	288.01	1045.61	10915.21	13353.13
Kalimantan Timur	1105.93	348.36	1083.11	11356.67	13894.07
Sulawesi Utara	1163.82	511.44	1284.22	6412.85	9372.34
Sulawesi Tengah (1997)	328.76	121.93	581.00	4062.02	5096.71
Sulawesi Selatan	2065.34	805.40	1546.56	18985.89	23376.19
Sulawesi Tenggara (1997)	65.80	193.21	185.64	1060.99	1505.64
Maluku	482.48	96.22	362.67	1396.56	2337.94
Irian Jaya	510.35	301.39	318.03	2140.18	3269.95
Indonesia	90835.35	20771.47	51965.27	422434.98	585007.06

Appenix 2.3.30. Estimate of Nox Emission from Motorized Vehicle by Province/Island and Type of Vehicle

Source : Rapid Assessment of Air, Water and Land population, Based oh WHO Publication 1

				(Ton/Year)	
Province/Island	Passenger Cars	Buses	Trucks	Motor Cycles	Total
Daerah Istimewa Aceh	11571.35	1513.47	12769.82	126343.94	152198.57
Sumatera Utara	94410.16	17357.36	78565.58	540708.85	731041.96
Sumatera Barat	14771.83	18489.56	25696.79	119172.23	178130.41
Riau	27640.73	13155.87	24852.94	214193.25	279842.79
Jambi (1997)	7617.21	1822.99	6715.96	58532.50	74688.65
Sumatera Seltan	83800.19	15341.00	78234.19	432296.22	609671.61
Benkulu (1997)	6524.64	340.27	5703.34	27150.81	39719.07
Lampung (1997)	23126.98	2110.65	25233.53	110513.71	160984.87
DKI Jakarta	754664.99	212821.90	261342.30	1425545.51	2654374.71
Jawa Barat	203973.43	56639.13	116952.62	707498.86	1085065.04
Jawa Tengah	210014.31	22804.47	152337.96	1735684.25	2120840.99
D.I. Yogyakarta (1997)	37275.66	4001.29	16741.04	292694.60	350712.59
Jawa Timur	254125.50	7645.22	146297.76	1722317.25	2130385.73
Bali	68107.30	11068.45	45462.03	476535.87	601173.66
Nusa Tenggara Barat (1997)	8186.38	2245.26	9477.09	73101.39	93010.12
Nusa Tenggara Timur (1997	4585.49	4204.91	5696.51	33027.02	47513.92
Timor Timur (1997)	2046.42	873.92	3499.76	15225.53	21645.63
Kalimantan Barat	3702.69	1851.69	3707.48	58352.11	67613.97
Kalimantan Tengah (1997)	3333.72	1412.34	3030.35	48113.16	55889.57
Kalimantan Selatan (1997)	18193.70	4073.03	17768.01	166189.41	206224.15
Kalimantan Timur	22750.49	7166.24	22281.08	233623.00	285820.81
Sulawesi Utara	23941.45	10521.15	26418.34	131921.55	192802.48
Sulawesi Tengah	6763.11	2508.32	11951.93	83623.22	104846.58
Sulawesi Selatan	42487.03	16568.17	31814.88	390011.44	480881.53
Sulawesi Tenggara (1997)	1353.58	3974.64	3818.85	21826.01	30973.08
Maluku	9925.33	1979.46	7460.73	28729.19	48094.71
Irian Jaya	10498.60	6200.08	6542.41	44026.46	67267.55
Indonesia	1868612.96	427298.71	1068999.76	8690091.01	12055002.45

Appendix 2.3.31. Estimate of CO Emission from Motorized Vehicle by Province / Island and Type of Vehicle, 1998

Source : Rapid Assessment of Air, Waterand Land Population, Based on WHO PublicationNo.62

Province	Waste Water Volume	BOD5	COD	SS	TDS	Minyak Oil	Ν
Daerah Istimewa Aceh							
Sumatera Utara	1668282.60	2941579.20	572522.90	4477598.70	4502941.20	21313.20	230689.4
Sumatera Barat	419120.00	5535254.00	856755.00	1624279.00	334174.00	146141.00	62700
Riau	11848262989.20	611014159.80	208888249.90	77114030.10	150366848.00	72973.30	13618539.7
Jambi	1091559194646.00	1561428.00	864292.00	1010099.00	522649.00	151772.00	25825
Sumatera Seltan	0.00	0.00	0.00	0.00	0.00	0.00	0
Benkulu	62133752.00	102729.40	43933.90	434928.30	79030.30	262.20	22107.3
Lampung	8178925.90	6050719.40	3550741.50	2291789.90	693507.90	1819002.00	69008.7
DKI Jakarta	8125998.00	4201955.00	4136626.00	3852781.00	11311074.00	53110.00	63235
Jawa Barat	2553010.40	1865920.90	1440582.20	1343814.90	2080953.10	103564.20	128251.6
Jawa Tengah	13288331000.00	22195091.00	1000790.00	14755272.00	8027608.00	124219.00	434677
D.I. Yogyakarta	59504.80	193727.10	115079.00	603405.00	204224.00	6580.00	34556
Jawa Timur	961510315.70	283024529.00	578783742.10	279534.50	481048850.60	159254.50	27740003.9
Bali	291798.30	122046.10	167997.50	3229093.70	161289.80	27896.60	154417.5
Nusa Tenggara Barat	11220441.50	150848.70	9.30	1051988.90	24080.60	33.00	0.3
Nusa Tenggara Timur	25588000.00	43009.00	52410.00	157926.00	36266.00	43.00	8848
Kalimantan Barat	0.00	0.00	0.00	0.00	0.00	0.00	0
Kalimantan Timur	746613.20	838744.50	449334.20		220365.70	170440.40	43412.4
Kalimantan Tengah	699591.10						
Sulawesi Utara							
Sulawesi Tengah	699591.10						
Sulawesi Selatan	1377866.00	8675531.00	500295.00	64854.50	2120132.00	214032.00	91645
Sulawesi Tenggara				1102241.00			
Maluku	5819.20	2127.30	1624.10	68.50	3118.90	0.00	1764.4
Indonesia	1117779682074.60	949621399.50	801424984.50	393377705.00	661737113.10	3070636.30	42,729,681.10

Appendix 2.3.32. Liquid Waste Loading and Water Pollution by Province and Pollutant (Tons/Year)

Source : Environmental Statistics of Indonesia

Appendix 2.3.33. Monthly Average Concentration of BOD, COD and SS Parameter in River Basin Along of Sumatera Utara River by Place of Taking Sample, 1997

Nonitoring Post	BOD		COD		РН		SS		
	Max	Min	Max	Min	Max	Min	Max	Min	
Sungai Deli									
Titi Gang Sejarah	28.90	6.30	47.80	9.80	6.90	6.80	6.99	6.72	
Titi pangkalan Mansyur (Sungai Babura)	30.30	5.15	47.20	7.98	6.99	6.65	6.80	6.30	
Titi Sukamulia	28.80	5.65	39.30	8.90	6.98	6.75	6.92	6.35	
Titi Petusah (Sungai Babura)	29.40	5.80	31.40	9.50	7.10	6.30	6.82	6.60	
Titi Pulau Brayan	29.10	6.15	37.80	11.17	7.05	6.30	6.89	6.30	
Titi Labuhan Deli	31.80	5.65	40.60	9.40	7.10	6.60	6.98	6.25	
Titi Belawan	32.10	6.25	47.80	11.80	7.05	6.45	6.75	6.10	
Titi Gantung Sebelum, PAM(Sei Belawan)	28.80	4.50	35.70	7.85	6.98	6.50	6.79	6.70	
Up. Strem PT Damai, Abadi (Sci. Krio)	31.70	5.20	65.30	8.20	7.10	6.20	6.84	6.65	
Titi Diski Up Stem, PT Hadi Baru (Sci Semayang)	30.30	5.76	45.20	9.35	7.15	6.50	6.79	6.45	
Titi Arun Dalu Down, Stem P. Gula, (Sci Semayang)	32.70	6.55	47.80	9.50	7.05	6.10	6.93	6.40	
Titi Kampung Lalang (Sungau Belawan)	29.70	4.20	39.30	7.90	6.96	6.10	6.95	6.50	
Titi Puti Payung Desa, Kelambir Hamparan Peral	29.40	5.25	47.20	9.60	7.15	6.48	6.77	6.40	
Sungai Belumai									
Sebelum Water Plant, PAM Tirtanadi	28.30	6.50	45.60	11.20	6.98	6.80	6.88	6.10	
Down Strem PT Sari, Morawa, Pasar III, Desa X-A	29.10	7.15	43.60	13.43	7.05	6.95	6.90	6.10	
Pertemuan Sei Belmai, Dengan S. Serdang (Kec. Batang Kuis)	29.30	7.15	51.20	13.43	7.10	6.40	6.92	5.80	
Sungai Asahan									
Up. Stream PT II U, Porsea	14.34	5.70	23.28	9.57	7.05	6.80	6.82	6.10	
Up. Stream PTP VI, Pulau Raja	11.50	5.70	20.72	9.80	6.95	6.30	6.82	6.20	
Titi Pulau Mandi, Sei Silau	6.52	6.10	13.40	11.30	7.10	6.75	6.80	6.30	
Depot Pertamina, Teluk Nibung	62.00	6.15	28.34	12.10	7.06	6.20	6.72	6.50	
Sungai Merbau									
Titi Aek Kota Batu	7.24	5.30	13.50	9.30	6.87	6.35	6.72	6.30	
Titi Aek Pandan	8.32	4.30	14.17	7.90	6.95	6.70	6.72	6.70	
Titi Gaya Baru, Merbau	6.75	4.70	12.60	8.20	7.10	6.30	6.72	6.40	

Source : Regional Environmenal Impact Management Agency of Sumatera Utara, 1997/1998 Cleam River Program

INTERNATIONAL MARITIME ORGANIZATION

4 ALBERT EMBANKMENT LONDON SE1 7SR

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Ref. T2/2.07

SN/Circ.200 26 May 1998

ADOPTION, DESIGNATION AND SUBSTITUTION OF ARCHIPELAGIC SEA LANES

1 At its sixty-ninth session (11 to 20 May 1998), the Maritime Safety Committee, by resolution MSC.72(69), adopted the annexed partial system of archipelagic sea lanes in Indonesian archipelagic waters.

2 Indonesia has undertaken to inform the Organization, in accordance with paragraph 3.13 of the General Provisions for adoption, designation and substitution of archipelagic sea lanes, of the date on which the partial system will be implemented, (which date will not be earlier than six months after the date of designation of the sea lanes by the Government of Indonesia).

3 Member Governments are invited to bring this information and the annexed partial system to the attention of all concerned. Information on the afore-mentioned implementation date will be provided in due course.

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ANNEX

RESOLUTION MSC.72(69) (adopted on 19 May 1998)

ADOPTION, DESIGNATION AND SUBSTITUTION OF ARCHIPELAGIC SEA LANES

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO regulation V/8 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, concerning the adoption by the Organization of ships' routeing systems, and article 53 of the United Nations Convention on the Law of the Sea (UNCLOS), concerning the adoption, designation and substitution of archipelagic sea lanes,

RECALLING FURTHER resolution A.858(20), which authorizes the Committee to perform, on behalf of the Organization, the function of adoption and amendment of traffic separation schemes, routeing measures other than traffic separation schemes, including designation and substitution of archipelagic sea lanes, and ship reporting systems.

TAKING INTO ACCOUNT the General Provisions for the adoption, designation and substitution of archipelagic sea lanes, adopted by resolution MSC.71(69),

HAVING CONSIDERED the recommendation of the Sub-Committee on Safety of Navigation at its forty-third session,

 ADOPTS, in accordance with SOLAS regulation V/8, resolution MSC.71(69) and UNCLOS article 53, the Partial System of Archipelagic Sea Lanes in Indonesian Archipelagic Waters, as set out in the Annex to the present resolution;

 RECOMMENDS that any associated rules and regulations adopted governing the use of archipelagic sea lanes by the Government of Indonesia shall be consistent with UNCLOS, including article 42;

 REQUESTS the Secretary-General to bring this resolution and its Annex to the attention of Members of the Organization and Contracting Governments to the 1974 SOLAS Convention.

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ANNEX

PARTIAL SYSTEM OF ARCHIPELAGIC SEA LANES IN INDONESIAN ARCHIPELAGIC WATERS

Part I

SEA LANE I: SOUTH CHINA SEA - NATUNA SEA - KARIMATA STRAIT - WESTERN JAVA SEA - SUNDA STRAIT - INDIAN (HINDIA) OCEAN

(Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 2, September 1988, corrected to 17 February 1997, 1:4,000,000, (I-1) - (I-15), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 38, February 1989, corrected to 11 May 1996, 1:1,000,000, (I-1) - (I-7), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 66, June 1990, corrected to 15 September 1997, 1:1,000,000, (I-8) - (I-15), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 147, March 1993, corrected to 6 March 1993, 1:500,000, (1-1) - (1-2), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 148, December 1995, corrected to 9 December 1995, 1:500,000, (1-3) - (1-4), WGS 84

Indonesian Navy Hydrographic Office Chart No. 149, September 1981, corrected to 15 February 1992, 1:500,000, (I-5) - (I-8), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 78, March 1995, corrected to 15 September 1997,1:200,000, (1-9) - (1-12), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 71, March 1995, corrected to 11 March 1995 1:200,000, (I-13) - (I-15), WGS 72

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

- (1-1) 03° 35'.00 N; 108° 51'.00 E
- (1-2) 03° 00'.00 N; 108° 10'.00 E
- (1-3) 00° 50'.00 N; 106° 16'.33 E
- (1-4) 00° 12'.33 S; 106° 44'.00 E
- (1-5) 02° 01'.00 S; 108° 27'.00 E
- (1-6) 02° 16'.00 S; 109° 19'.50 E
- (I-7) 02° 45'.00 S; 109° 33'.00 E
- (I-8) 03° 46'.75 S; 109° 33'.00 E
- (1-9) 05° 12'.50 S; 106° 54'.50 E

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- (1-10) 05° 17'.25 S; 106° 44'.50 E
- (1-11) 05° 17'.25 S; 106° 27'.50 E
- (1-12) 05° 15'.00 S; 106° 12'.50 E
- (I-13) 05° 57'.25 S; 105° 46'.33 E
- (1-14) 06° 18'.50 S; 105° 33'.25 E
- (1-15) 06° 24'.75 S; 104° 41'.42 E

Notes for the use of this archipelagic sea lane:

- (a) Geographical positions (1-1) to (1-3) define the axis line from the South China Sea through the Natura Sea.
- (b) Geographical positions (1-3) to (1-5) define the axis line from the Natura Sea to the Karimata Strait.
- (c) Geographical positions (1-5) to (1-7) define the axis line through the Karimata Strait.
- (d) Geographical positions (1-7) to (1-12) define the axis line through the western Java Sea.
- (c) Geographical positions (I-12) to (I-15) define the axis line through the Sunda Strait into Indian (Hindia) Ocean.

SEA LANE IA: SPUR FROM NORTH OF P. MERAPAS TO POINT (I-3) (Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 38, February 1989, corrected to 11 May 1996, 1:1,000,000, (1A-1) - (1-3), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 2, September 1988, corrected to 17 February 1997, 1:4,000,000, (1A-1) - (1-3), Bessel 1841

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

(IA-1) 01° 52'.00 N; 104° 55'.00 E

(1-3) 00° 50'.00 N; 106° 16'.33 E

Notes for the use of this archipelagic sea lane:

(a) Geographical positions (IA-1) to (I-3) define the axis line from the Singapore Strait through the Natuna Sea.

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PART II

SEA LANE II: CELEBES (SULAWESI) SEA - MAKASAR STRAIT - LOMBOK STRAIT - INDIAN (HINDIA) OCEAN

(Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 2, September 1988, corrected to 17 February 1997, 1:4,000,000, (11-1) - (11-8), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 121, October 1993, corrected to 7 July 1997, 1:1,000,000, (II-1) - (II-4), Bessel 1841

Indonesian Navy Hydrographic Office Chart No.111, August 1997, corrected to 4 August 1997, 1:1,000,000 (II-4) - (II-8), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 128, October 1997, corrected to 20 October 1997, 1:500,000, (II-4) - (II-5), WGS 72

Indonesian Navy Hydrographic Office Chart No. 113, July 1988, corrected to 2 July 1988, 1:500,000, (11-6) - (11-8), WGS 72

Indonesian Navy Hydrographic Office Chart No. 291, June 1996, corrected to 20 July 1996, 1: 200,000, (II-7)-(II-8) ,WGS 72

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

- (II-1) 00° 57'.00 N; 119° 33'.00 E
- (II-2) 00° 00'.00; 119° 00'.00 E
- (I1-3) 02° 40'.00 S; 118° 17'.00 E
- (11-4) 03° 45'.00 S; 118° 17'.00 E
- (II-5) 05° 28'.00 S; 117° 05'.00 E
- (11-6) 07° 00'.00 S; 116° 50'.00 E
- (11-7) 08° 00'.00 S; 116° 00'.00 E
- (II-8) 09° 01'.00 S; 115° 36'.00 E

Notes for the use of this archipelagic sea lane:

- (a) Geographical positions (II-1) to (II-2) define the axis line from the Celebes (Sulawesi) Sea to the Makasar Strait.
- (b) Geographical positions (II-3) to (II-6) define the axis line between Borneo (Kalimantan) and Celebes (Sulawesi) islands.
- (c) Geographical positions (11-6) to (11-7) define the axis line through the Bali Sea.
- (d) Geographical positions (II-7) to (II-8) define the axis line through Lombok Strait to the Indian (Hindia) Ocean

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PART III

SEA LANE IIIA: PACIFIC OCEAN - MALUKU SEA - SERAM SEA - BANDA SEA - OMBAI STRAIT - SAWU SEA - INDIAN (HINDIA) OCEAN (Reference Charts: Publisher, Chart number and point numbers and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 3, March 1985, corrected to 13 October 1997, 1:4,000,000, (IIIA-1) - (IIIA-11), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 403, September 1996, corrected to 14 September 1996, 1: 500,000, (IIIA-1) - (IIIA-3), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 357, December 1985, corrected to 17 February 1997, 1:1,000,000, (IIIA-1) - (IIIA-3), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 142, May 1991, corrected to 24 August 1996, 1:1,000,000, (IIIA-4) - (IIIA-8), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 366, July 1993, corrected to 15 September 1997, 1:1,000,000, (IIIA-10) - (IIIA-13), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 367, August 1993, corrected to 7 July 1997, 1:1,000,000, (IIIA-9) - (IIIA-10), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 112, June 1991, corrected to 10 June 1995 ,1:1,000,000, (IIIA-9) - (IIIA-13), Bessel 1841

Indonesian Navy Hydrographic Office Chart No 363, January 1990, corrected to 15 June 1996, 1:1,000,000, (IIIA-3) - (IIIA-6), Bessel 1841

Indonesian Navy Hydrographic Office Chart No 404, October 1993, corrected to 13 November 1993, 1: 500,000, (IIIA-4)-(IIIA-5), Bessel 1841

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

(IIIA-1) 03° 27'.00 N; 127° 40'.50 E

(IIIA-2) 01° 40'.00 N; 126° 57'.50 E

(111A-3) 01° 12'.00 N; 126° 54'.00 E

(IIIA-4) 00° 09'.00 N; 126° 20'.00E

(IIIA-5) 01° 53'.00 S; 127° 02'.00 E

(111A-6) 02° 37'.00 S; 126° 30'.00 E

(IIIA-7) 02° 53'.00 S; 125° 30'.00 E

(IIIA-8) 03° 20'.00 S; 125° 30'.00 E

(IIIA-9) 08° 25'.00 S; 125° 20'.00 E

(IIIA-10) 09° 03'.00 S; 123° 34'.00 E

(IIIA-11) 09° 23'.00 S; 122° 55'.00 E

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(IIIA-12) 10° 12'.00 S; 121° 18'.00 E

(IIIA-13) 10° 44'.50 S; 120° 45'.75 E

Notes for the use of this archipelagic sea lane:

- (a) Geographical positions (IIIA-1) to (IIIA-5) define the axis line from the Pacific Ocean through the Maluku Sea.
- (b) Geographical positions (IIIA-5) to (IIIA-7) define the axis line through the Seram Sea.
- (c) Geographical positions (IIIA-7) to (IIIA-9) define the axis line through the western Banda Sea to the Ombai Strait.
- (d) Geographical positions (IIIA-9) to (IIIA-13) define the axis line through the Ombai Strait and Sawu Sea between Sumba and Sawu Islands to Indian (Hindia) Ocean.

SEA LANE III E : SPUR FROM POINT IIIA-2 - IIIE-2 (Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 3, March 1985, corrected to 13 October 1997, 1:4,000,000, (IIIA-2) - (IIIE-2), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 403, September 1996, corrected to 14 September 1996, 1:500,000, (IIIA-2) - (IIIE-2), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 357, December 1985, corrected to 17 February 1997, 1:1,000,000, (IIIA-2) - (IIIE-1), Bessel 1841

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

(111A-2) 01° 40'.00 N; 126° 57'.50 E

(IIIE-1) 04° 12'.10 N; 126° 01'.00 E

(IIIE-2) 04° 32'.20 N; 125° 10'.40 E

Notes for the use of this archipelagic sea lane:

(a) Geographical positions (IIIA-2) to (IIIE-2) define the axis line from the Maluku Sea to the Celebes (Sulawesi) Sea.

SEA LANE IIIB: SPUR FROM POINT IIIA-8 - IIIB-2; BANDA SEA - LETI STRAIT - TIMOR SEA (Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 3, March 1985, corrected to 13 October 1997, 1:4,000,000, (IIIA-8) - (IIIB-2), Bessel 1841

Indonesian Navy Hydrographic Office Chart No. 142, May 1991, corrected to 24 August 1996,1:1,000,000, (IIIA-8) - (IIIB-1), Bessel 1841

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Indonesian Navy Hydrographic Office Chart No. 367, August 1993, corrected to 7 July 1997, 1:1,000,000, (IIIB-2), Bessel 1841 Indonesian Navy Hydrographic Office Chart No146, October 1993, corrected to 1 April 1995, 1:1,000,000,

(IIIB-2), Bessel 1841

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

(111A-8) 03° 20'.00 S; 125° 30'.00 E

(IIIB-1) 04° 00'.00 S; 125° 40'.00 E

(IIIB-2) 08° 31'.00 S; 127° 33'.00 E

Notes for the use of this archipelagic sea lane:

 Geographical positions (IIIA-8) to (IIIB-2) define the axis line through the Banda Sea and Leti Strait to the Timor Sea.

SEA LANE IIIC: SPUR FROM POINT IIIA-8 - IIIC-2; BANDA SEA - ARAFURU SEA (Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 3, March 1985, corrected to 13 October 1997, 1:4,000,000, (IIIA-8) - (IIIC-2), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 142, May 1991, corrected to 24 August 1996, 1:1,000,000, (IIIA-8) - (IIIB-1), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 367, August 1993, corrected to 7 July 1997 1:1,000,000, (IIIC-1) - (IIIC-2), Bessel 1841 Indonesian Navy Hydrographic Office Chart No146, October 1993, corrected to 1 April 1995, 1:1,000,000, (IIIC-1)-(IIIC-2), Bessel 1841

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

(111A-8) 03° 20'.00 S; 125° 30'.00 E (111B-1) 04° 00':00 S; 125° 40'.00 E (111C-1) 06° 10'.00 S; 131° 45'.00 E (111C-2) 06° 44'.00 S; 132° 35'.00 E

Notes for the use of this archipelagic sea lane:

(a) Geographical positions (IIIA-8) to (IIIC-2) define the axis line through the Banda Sea to the Arafuru Sea.

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SEA LANE IIID: SPUR FROM POINT IIIA-11 - IIID-1; SAWU SEA - SEA BETWEEN SAWU AND ROTI ISLANDS - INDIAN (HINDIA) OCEAN · (Reference Charts: Publisher, Chart number and scale, points reflected on chart)

Indonesian Navy Hydrographic Office Chart No. 3, March 1985, corrected to 13 October 1997, 1:4,000,000, (IIIA-11) - (IIID-1), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 112, June 1991, corrected to 10 June 1995, 1:1,000,000, (IIIA-11) - (IIID-1), Bessel 1841 Indonesian Navy Hydrographic Office Chart No. 366, July 1993, corrected to 15 September 1997, 1:1,000,000, (IIIA-11) - (IIID-1), Bessel 1841

Description of the archipelagic sea lane

The axis line connects the following geographical positions:

(IIIA-11) 09° 23'.00 S; 122° 55'.00 E

(IIID-1) 10° 58'.00 S; 122° 11'.00 E

Notes for the use of this archipelagic sea lane:

(a) Geographical positions (IIIA-11) to (IIID-1) define the axis line from the Sawu Sea to the Sea between Sawu and Roti Islands to the Indian (Hindia) Ocean.

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Appendix 2.4.2. 1st Density Survey Log in Sunda Strait (from 1400hours May 15th to 1400hour May 17th 2001)

Serial No	Date	Local Time	Gate Line	Direction	Kind of Vessel	Gross Ton	LOA(m)	Speed	Remark
1	0515	1415	В	Northbound	Fishing Boat	100	50.00	8.0	
2	0515	1415	В	Northbound	Fishing Boat	100	50.00	8.0	
3	0515	1420	В	Northbound	Cargo Boat	15,000	150.00	10.0	
4	0515	1430	В	Southbound	Fishing Boat	100	50.00	6.0	
5	0515	1430	В	Northbound	Fishing Boat	20	10.00	5.0	
6	0515	1435	В	Southbound	Fishing Boat	5	10.00	5.0	
7	0515	1440	В	Southbound	Fishing Boat	5	10.00	6.0	
8	0515	1440	В	Southbound	Fishing Boat	100	50.00	6.0	
9	0515	1445	В	Southbound	Fishing Boat	5	10.00	6.0	
10	0515	1445	В	Southbound	Fishing Boat	5	10.00	6.0	
11	0515	1445	Α	Southbound	Fishing Boat	5	10.00	5.0	
12	0515	1455	В	Northbound	Fishing Boat	5	10.00	6.0	
13	0515	1505	В	Northbound	Cargo Boat	10,000	150.00	8.0	
14	0515	1520	Α	Southbound	Fishing Boat	5	10.00	6.0	
15	0515	1530	В	Northbound	Fishing Boat	100	50.00	7.0	
16	0515	1530	В	Northbound	Fishing Boat	10	10.00	7.0	
17	0515	1600	В	Northbound	Cargo Boat	3,000	100.00	12.0	
18	0515	1610	Α	Northbound	Cargo Boat	5,000	100.00	10.0	
19	0515	1630	В	Southbound	Cargo Boat	3,000	100.00	8.0	
20	0515	1705	В	Southbound	Fishing Boat	5	10.00	5.0	
21	0515	1710	В	Southbound	Fishing Boat	5	10.00	5.0	
22	0515	1710	В	Southbound	Fishing Boat	2	5.00	5.0	
23	0515	1735	В	Southbound	Cargo Boat	50,000	200.00	12.0	
24	0515	1857	В	Southbound	Cargo Boat	2,000	100.00	10.0	
25	0515	1858	В	Southbound	Cargo Boat	20,000	200.00	15.0	
26	0515	2125	В	Northbound	Cargo Boat	10,000	150.00	15.0	
27	0515	2355	В	Northbound	Cargo Boat	10,000	150.00	15.0	
28	0516	0015	Α	Southbound	Cargo Boat	5,000	100.00	15.0	
29	0516	0020	Α	Northbound	Fishing Boat	300	50.00	10.0	
30	0516	0020	В	Southbound	Cargo Boat	2,000	70.00	10.0	
31	0516	0210	Α	Northbound	Tanker	70,000	200.00	12.0	
32	0516	0320	В	Northbound	Cargo Boat	5,000	100.00	10.0	
33	0516	0515	В	Southbound	Cargo Boat	10,000	150.00	12.0	
34	0516	0520	В	Southbound	Cargo Boat	5,000	100.00	10.0	
35	0516	0550	В	Northbound	Tanker	50,000	300.00	10.0	
36	0516	0552	A	Southbound	Cargo Boat	10,000	150.00	10.0	
37	0516	0615	В	Northbound	Tanker	30,000	250.00	10.0	
38	0516	0630	В	Northbound	Fishing Boat	100	50.00	6.0	
39	0516	0655	A	Northbound	Tanker	10,000	150.00	12.0	
40	0516	0710	Α	Southbound	Ferry	5,000	100.00	12.0	

41 0516 0705 A Southbound Cargo Boat 5,000 150.00 12.0 42 0516 0815 A Northbound Tanker 100,000 300.00 12.0 43 0516 0950 B Southbound Fishing Boat 5 10.00 6.0 44 0516 0953 A Southbound Tanker 50,000 250.00 10.0 45 0516 1000 A Northbound Tanker 30,000 200.00 10.0 46 0516 1003 B Southbound Cargo Boat 10,00 150.00 10.0 47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5,000 100.00 10.0	
42 0516 0815 A Northbound Tanker 100,000 300.00 12.0 43 0516 0950 B Southbound Fishing Boat 5 10.00 6.0 44 0516 0953 A Southbound Tanker 50,000 250.00 10.0 45 0516 1000 A Northbound Tanker 30,000 200.00 10.0 46 0516 1003 B Southbound Cargo Boat 10,00 150.00 10.0 47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5000 100.00 10.0	
43 0516 0950 B Southbound Fishing Boat 5 10.00 6.0 44 0516 0953 A Southbound Tanker 50,000 250.00 10.0 45 0516 1000 A Northbound Tanker 30,000 200.00 10.0 46 0516 1003 B Southbound Cargo Boat 10,00 150.00 10.0 47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5 000 100 00 10 0	
44 0516 0953 A Southbound Tanker 50,000 250.00 10.0 45 0516 1000 A Northbound Tanker 30,000 200.00 10.0 46 0516 1003 B Southbound Cargo Boat 10,00 150.00 10.0 47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5.000 100.00 10.0	
45 0516 1000 A Northbound Tanker 30,000 200.00 10.0 46 0516 1003 B Southbound Cargo Boat 10,00 150.00 10.0 47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5.000 100.00 10.0	
46 0516 1003 B Southbound Cargo Boat 10,00 150.00 10.0 47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5.000 100.00 10.0	
47 0516 1017 B Southbound Tanker 100,000 300.00 12.0 48 0516 1040 A Northbound Cargo Boat 5 000 100 00 10 0	
48 0516 1040 A Northbound Carge Beat 5 000 100 00 100	
[40]0510[1040] A ["""""""""""""""""""""""""""""""""""	
49 0516 1053 A Northbound Cargo Boat 7,000 150.00 10.0	
50 0516 1110 B Southbound Cargo Boat 40,000 250.00 15.0	
51 0516 1156 A Southbound Cargo Boat 20,000 150.00 12.0	
52 0516 1220 B Southbound Ferry 10 15.00 7.0	
53 0516 1222 B Southbound Ferry 10 15.00 7.0	
54 0516 1222 B Southbound Ferry 10 15.00 7.0	
55 0516 1230 B Northbound Tanker 30,000 200.00 12.0	
56 0516 1500 A Northbound Cargo Boat 10,000 150.00 10.0	
57 0516 1510 B Northbound Cargo Boat 500 60.00 8.0	
58 0516 1520 B Northbound Cargo Boat 500 60.00 8.0	
59 0516 1530 B Northbound Cargo Boat 10,000 150.00 12.0	
60 0516 1533 B Southbound Cargo Boat 200 40.00 8.0	
61 0516 1535 B Southbound Cargo Boat 300 50.00 7.0	
62 0516 1545 B Southbound Cargo Boat 300 50.00 7.0	
63 0516 1550 B Southbound Cargo Boat 300 50.00 7.0	
64 0516 1610 B Southbound Tanker 7,000 150.00 12.0	
65 0516 1625 B Southbound Cargo Boat 100 30.00 6.0	
66 0516 1650 B Southbound Fishing Boat 5 10.00 5.0	
67 0516 1650 B Southbound Fishing Boat 5 10.00 5.0	
68 0516 1714 A Northbound Cargo Boat 5,000 100.00 12.0	
69 0516 1853 B Southbound Cargo Boat 3,000 100.00 10.0	
70 0516 2030 B Northbound Cargo Boat 10,000 150.00 10.0	
71 0517 0400 B Southbound Tanker 50,000 250.00 12.0	
72 0517 0455 A Northbound Cargo Boat 300 50.00 10.0	
73 0517 0510 B Southbound Cargo Boat 5,000 150.00 12.0	
74 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
75 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
76 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
77 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
78 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
79 0517 0550 B Northbound Fishing Boat 5 10.00 6 0	
80 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
81 0517 0550 B Northbound Fishing Boat 5 10.00 6 0	
82 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	
83 0517 0550 B Northbound Fishing Boat 5 10.00 6.0	

No.	Date	L.Time	G. Line	Direction	Kind of Vessel	G. Ton	L O A (m)	Speed	Remark
84	0517	0550	В	Northbound	Fishing Boat	5	10.00	6.0	
85	0517	0550	В	Northbound	Fishing Boat	5	10.00	6.0	
86	0517	0550	В	Northbound	Fishing Boat	5	10.00	6.0	
87	0517	0550	В	Northbound	Fishing Boat	5	10.00	6.0	
88	0517	0600	В	Northbound	Cargo Boat	300	50.00	7.0	
89	0517	0610	В	Southbound	Cargo Boat	300	50.00	7.0	
90	0517	0655	В	Southbound	Tanker	30,000	200.00	12.0	
91	0517	0710	В	Northbound	Tanker	50,000	250.00	10.0	
92	0517	0821	Α	Northbound	Cargo Boat	3,000	100.00	10.0	
93	0517	0908	В	Northbound	Tanker	30,000	200.00	12.0	
94	0517	0910	Α	Northbound	Cargo Boat	5,000	100.00	10.0	
95	0517	0918	Α	Southbound	Cargo Boat	10,000	150.00	15.0	Container Vessel
96	0517	0937	В	Northbound	Fishing Boat	5	10.00	5.0	
97	0517	0958	В	Northbound	Cargo Boat	50	30.00	5.0	
98	0517	1015	Α	Southbound	Towing Vessel	50	25.00	4.0	LOA150m, 2barges
99	0517	1053	В	Northbound	Cargo Boat	30,000	200.00	15.0	
100	0517	1058	В	Northbound	Fishing Boat	10	15.00	5.0	
101	0517	1148	В	Northbound	Fishing Boat	5	10.00	5.0	
102	0517	1245	В	Northbound	Cargo Boat	500	60.00	7.0	
103	0517	1300	В	Southbound	Fishing Boat	100	40.00	7.0	
104	0517	1305	В	Southbound	Fishing Boat	5	10.00	6.0	
105	0517	1305	В	Southbound	Fishing Boat	5	10.00	6.0	
106	0517	1307	В	Northbound	Cargo Boat	300	50.00	6.0	
107	0517	1330	В	Northbound	Towing Vessel	20	15.00	4.0	LOA200m, 2barges
108	0517	1340	В	Southbound	Cargo Boat	100	40.00	6.0	

Seria	Data	Local	Cata	Traffic	Kind of	Gross	Shin's Nome	Speed	Remark (Last Port / Next
<u>l No.</u>	Date	Time	Gale	Route	Vessel	Ton	Sinhama	Speed	Port)
0001	1018	1500	Α	Northboun	Tanker	5,000	Stolt Sunrise	3.1	
0002	1018	1503	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0003	1018	1520	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0004	1018	1530	А	Northboun	Cargo	5 000	Thor Star	14.0	
0001	1010	1500		d	eurgo	5,000	(Thailand)	10.0	
0005	1018	1533	Α	Southboun	Cargo	5,000		12.0	
0006	1018	1610	Cros	Eastbound	Speed Boat	100		20.0	Bakauhuni to Merak
0007	1018	1620	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0008	1018	1650	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0009	1018	1710	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0010	1018	1795	Cros	Westbound	Ferry	800		10.0	Merak to Bakauhuni
0011	1018	1720	Cros	Westbound	Ferry	1,000	KMP MULIA	10.0	Merak to Bakaununi
0012	1010	1750		Southbound	Perry	2,000		10.0	
0013	1018	1730	A	Northboun	Tankan	30,000		12.0	
0014	1018	1720	A	Factbound	Formu	1 000		10.0	Pakauhuni ta Manak
0015	1018	1830	Cros	Easthound	Forry	1 000		10.0	Bakauhuni to Merak
0017	1018	1855	Cros	Westhound	Ferry	1 000		10.0	Merak to Bakauhuni
0018	1018	1905	Cros	Westhound	Ferry	1.000		10.0	Merak to Bakauhuni
0019	1018	1910	R	Southhoun	Cargo	4.000		8.0	
0020	1018	1920	B	Southboun	Cargo	50		8.0	
0021	1018	1910	B	Southboun	Cargo	400		10.0	
0022	1018	1915	В	Northboun	Cargo	200		10.0	
0023	1018	1920	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0024	1018	1945	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0025	1018	2000	В	Southboun	Passenger	15,000		12.0	
0026	1018	2015	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0027	1018	2018	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0028	1018	2050	Cros	Eastbound	Ferry	2,000		10.0	Bakauhuni to Merak
0029	1018	2057	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0030	1018	2106	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0031	1018	2115	В	Northboun	Cargo	700		8.0	
0032	1018	2145	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0033	1018	2150	Α	Northboun	Cargo	5,000		12.0	
0034	1018	2152	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0035	1018	2154	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0036	1018	2200	Cros	Eastbound	Ferry	1,000		10.0	Bakaununi to Merak
0037	1018	2209	Cros	Fastbound	Ferry	2 000		10.0	Merak to Bakaununi Pakauhuni ta Marak
0030	1018	2225		Northboun	Cargo	2,000		10.0	Dakaununi to Merak
0039	1018	2250	A Cros	Westhound	Forry	2,000		10.0	Merak to Bakauhuni
0040	1018	2305	Cros	Easthound	Ferry	1.000		10.0	Bakauhuni to Merak
0042	1018	2317	Cros	Westbound	Ferry	1.000		10.0	Merak to Bakauhuni
0043	1018	2326	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0044	1018	2329	A	Northboun	Cargo	20,000		15.0	
0045	1018	2332	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0046	1018	2352	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0047	1018	2358	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0048	1019	0040	Cros	Eastbound	Ferry	1,500		10.0	Bakauhuni to Merak
0049	1019	0100	Cros	Eastbound	Ferry	1,500		10.0	Bakauhuni to Merak
0050	1019	0100	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0051	1019	0110	Cros	Westbound	Ferry	1,500		10.0	Merak to Bakauhuni
0052	1019	0130	Α	Northboun	Cargo	500		10.0	
0053	1019	0135	Α	Northboun	Cargo	1,000		12.0	
0054	1019	0230	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0055	1019	0230	Cros	Westbound	Ferry	1,500		10.0	Merak to Bakauhuni
0056	1019	0233	Cros	Westbound	Ferry	1,000		12.0	Merak to Bakauhuni
0057	1019	0300	A	Southboun	Towing	150		3.0	
0058	1019	0300	Cros	Eastbound	Ferry	1,500		10.0	Bakauhuni to Merak
0059	1019	0315	Cros	Lastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0060	1019	0313	B	Weath	Cargo	5,000		12.0	Manaly to Deleasely
0061	1018	საან	Uros	westbound	rerry	1,300		10.0	Merak to Bakaununi

Seria	Data	Local	Cata	Traffic	Kind of	Gross	Shin's Nama	Speed	Remark (Last Port / Next
1 No.	Date	Time	Gate	Route	Vessel	Ton	Sinh 2 maine	Speed	Port)
0062	1019	0405	Α	Southboun	Cargo	2,000		12.0	
0063	1019	0410	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0064	1019	0413	A	Southboun	Cargo	1,000		11.0	
0065	1019	0415	Cros	Eastbound	Ferry	800		10.0	Bakauhuni to Merak
0067	1019	0420	A A	Northham	Cargo	2,000		12.0	
1000	1019	0410	A A	Northbour	Cargo	400 300		8.0	
0000	1019	0430	Cros	Westhound	Ferry	1,000		10.0	Merak to Bakauhuni
0070	1019	0445	A	Southhoun	Cargo	2.000		12.0	
0071	1019	0505	B	Southboun	Cargo	2,000		8.0	
0072	1019	0520	Ã	Southboun	Tanker	700		7.0	
0073	1019	0550	Α	Northboun	Cargo	47,404	<u>Dynast</u> ar	14.0	Wood Chip
0074	1019	0540	В	Northboun	Cargo	2,000		9.0	
0075	1019	0530	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0076	1019	0610	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0077	1019	0615	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0078	1019	0615	A	Northboun	Cargo	80		5.0	
0079	1019	0620	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0080	1019	0630	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0081	1019	0040	Cros	Lastbound	Ferry	1,000		10.0	Бакаununi to Merak
0082	1019	0700	A A	Southbour	Cargo Tankor	40.000		13.0	
0084	1019	0730	Cros	Westhound	Ferry	1,000		10.0	Merak to Bakauhuni
0085	1019	0740	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0086	1019	0800	A	Southboun	Cargo	3,000		8.0	incluit to Danaunum
0087	1019	0810	A	Northboun	Fishing Boat	300		8.0	
0088	1019	0810	Cros	<u>Westbound</u>	Ferry	1,000		10.0	Merak to Bakauhuni
0089	1019	0820	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0090	1019	0830	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0091	1019	0830	Α	Northboun	Cargo	20,000		12.0	
0092	1019	0841	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0093	1019	0843	A	Northboun	Cargo	200		6.0	
0094	1019	0845	A	Northboun Footbourd	Cargo	200		0.U	Pakauhuni ta Man-l
0095	1019	0000	Cros	Eastbound	Ferry	2 000		10.0	Dakaununi to Merak Bakauhuni to Morak
0090	1019	0905		Northbour		2,000		6.0	Dakaunum to merak
0098	1019	0906	Cros	Westhound	Speed Boat	200		20.0	Merak to Bakauhuni
0099	1019	0910	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0100	1019	0920	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0101	1019	0924	Cros	Westbound	Ferry	2,000	FP FEREE	10.0	Merak to Bakauhuni
0102	1019	0930	Cros	Eastbound	Ferry	2,000		10.0	Bakauhuni to Merak
0103	1019	0932	В	Northboun	Container	20,000	Kanji 2 caracters	15.0	COSCO
0104	1019	0935	Α	Northboun	Cargo	200		5.0	
0105	1019	0943	Α	Southboun	Tanker	3,000		10.0	
0106	1019	0946	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0107	1019	0948	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0108	1019	1000	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0109	1019	1015	Cros	Northhouse	Speed Boat	5 000		20.0 10.0	Бакаununi to Merak
0110	1019	1017	A	Fastbound	Form	2 000		10.0	Bakauhuni to Morak
0112	1019	1023	Cros	Westhound	Ferry	2.000		10.0	Merak to Bakauhuni
0113	1019	1030	Cros	Westbound	Speed Boat	2,000		20.0	Merak to Bakauhuni
				Southboun	Speca Dout				G/T 75,275, LOA 269.7m.
0114	1019	1031	Α	d	Cargo	75,275	Goonzaran	15.0	Korea to Richards Bav
0115	1019	1050	Cros	Eastbound	Ferrv	1,000		10.0	Bakauhuni to Merak
0116	1019	1100	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0117	1019	1110	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0118	1019	1121	Cros	Eastbound	Ferry	2,000		10.0	Bakauhuni to Merak
0119	1019	1121	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0120	1019	1130	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0121	1019	1140	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0122	1019	1145	В	Southboun	Container	2,000		15.0	

Seria	Data	Local	Cata	Traffic	Kind of	Gross	Shin's Nome	Speed	Remark (Last Port / Next
1 No.	Date	Time	Gate	Route	Vessel	Ton	Ship's Name	Speed	Port)
0123	1019	1150	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0124	1019	1155	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0125	1019	1200	Α	Northboun	Cargo	100		5.0	Wooden Ship
0126	1019	1205	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0127	1019	1220	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0128	1019	1230	Α	Southboun	Tanker	30,000		14.0	
0129	1019	1250	Α	Northboun	Cargo	20,000		14.0	
0130	1019	1235	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0131	1019	1240	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0132	1019	1250	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0133	1019	1255	Cros	Eastbound	Speed Boat	100		16.0	Bakauhuni to Merak
0134	1019	1315	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0135	1019	1315	В	Northboun	Cargo	15,000		14.0	
0136	1019	1325	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0137	1019	1330	Α	Northboun	Cargo	1,500		12.0	
0138	1019	1320	Cros	Eastbound	Speed Boat	100		16.0	Bakauhuni to Merak
0139	1019	1315	В	Northboun	Cargo	6,000		16.0	
0140	1019	1335	Cros	Westbound	Ferry See 15	1,000		10.0	Merak to Bakauhuni
0141	1019	1345		Eastbound	Speed Boat	1 000		10.0	Bakaununi to Merak
0142	1019	1343	B	Southboun	Cargo	1,000		12.0	Manak to Palanhari
0143	1019	1355	Cros	Fasthound	Speed Boat	1 000		10.0	Merak to Dakaununi Bakauhuni ta Manak
0144	1019	1400	Cros	Eastbound	Ferry	1,000		10.0	Bakauliulii to Merak
0143	1019	1410	Cros	Eastbound	Speed Reat	1,000		16.0	Bakauhuni to Merak
0140	1019	1410	Cros	Wostbound	Eorry	1 000		10.0	Morak to Bakauhuni
0147	1019	1430	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni Merak to Bakauhuni
0140	1019	1442		Southboun	Tanker	800		10.0	
0150	1019	1445	A	Southboun	Cargo	20		6.0	
0151	1019	1446	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0152	1019	1500	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0153	1019	1500	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0154	1019	1510	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0155	1019	1515	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0156	1019	1525	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0157	1019	1530	Cros	Eastbound	Speed Boat	100		16.0	Bakauhuni to Merak
0158	1019	1545	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0159	1019	1600	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0160	1019	1555	Cros	Eastbound	Speed Boat	100		16.0	Bakauhuni to Merak
0161	1019	1600	В	Southboun	Container	8,000		16.0	
0162	1019	1555	Cros	Westbound	Speed Boat	100		16.0	Merak to Bakauhuni
0163	1019	1610	Cros	Westbound	Ferry	1,000	Menggalla	10.0	Merak to Bakauhuni
0164	1019	1615	Α	Southboun	Cargo	50		6.0	Wooden Ship
0165	1019	1625	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0166	1019	1630	Cros	Westbound	Speed Boat	200		18.0	Merak to Bakauhuni
0167	1019	1645	Cros	Eastbound	Speed Boat	200	9	20.0	Bakauhuni to Merak
0168	1019	1/00	A	Southboun	Cargo	87,831	Successor	15.0	
0169	1019	1050	A	Northboun	Cargo	50,000		13.0	Weeder Chin
0170	1019	1717	A	Weath	Cargo	00		5.U	wooden Snip Marak ta Bakashari
0179	1019	1795	UT0S	Northhouse	Speed Boat	30,000		10.0	Merak to Bakaununi
0172	1019	1740		Southbour	Cargo	30,000		15.0	
0173	1019	1750	Cros	Fastbound	Forry	800		10.0	Bakauhuni to Morak
0174	1019	1800	Cros	Eastbound	Forry	800		10.0	Bakauhuni to Merak
0176	1019	1810	Cros	Westhound	Ferry	1 000		10.0	Merak to Bakauhuni
0177	1019	1822	Cros	Easthound	Ferry	1.000		10.0	Bakauhuni to Merak
0178	1019	1830	Cros	Westhound	Ferry	1.000		10.0	Merak to Bakauhuni
0179	1019	1835	Cros	Eastbound	Ferry	1.000		10.0	Bakauhuni to Merak
0180	1019	1835	Cros	Westbound	Ferry	1.000		10.0	Merak to Bakauhuni
0181	1019	1901	Cros	Eastbound	Ferry	800		10.0	Bakauhuni to Merak
0182	1019	1910	В	Southboun	Cargo	2,000		8.0	
0183	1019	1905	Cros	Eastbound	Ferry	800		10.0	Bakauhuni to Merak
0184	1019	1912	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni

Seria	Data	Local	Cata	Traffic	Kind of	Gross	Shin's Name	Spood	Remark (Last Port / Next
1 No.	Date	Time	Gale	Route	Vessel	Ton	Ships Mane	Speed	Port)
0185	1019	1920	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0186	1019	1920	В	Southboun	Cargo	4,000		14.0	
0187	1019	1945	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0188	1019	1950	Α	Northboun	Cargo	10,000		15.0	
0189	1019	2030	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0190	1019	2034	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0191	1019	2050	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0192	1019	2100	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0193	1019	2110	В	Southboun	Cargo	2,000		12.0	
0194	1019	2138	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0195	1019	2156	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0196	1019	2200	В	Southboun	Cargo	5,000		10.0	
0197	1019	2206	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0198	1019	2210	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0199	1019	2228	B	Southboun	Cargo	1,000		12.0	
0200	1019	2233	В	Southboun	Cargo	2,000		8.0	
0201	1019	2238	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0202	1019	2241 9201	A	Northboun	Cargo	10,000		12.0	Dekenhuni te Maral
0203	1019	2320	Cros	Eastbound	Ferry	۵,000 1,000		10.0	Bakaununi to Merak
0204	1019	2212	Cros	LastDound Westhernel	Ferry	2 000		10.0	Dakaullulli to Merak Morak to Rakauburi
0200	1019	2343	LT0S	Northbourg	Cargo	۵,000 5 000		10.0	
0200	1019	£333 0000	A	Fastbound	Cargo Form	1 000		10.0	Bakauhuni to Morak
0202	1020	0020	Cros	Westhound	Forry	1 500		10.0	Marak to Bakauhuni
0200	1020	0025		Northbour	Cargo	70,000		13.0	
0203	1020	0020	Cros	Westbound	Eerry	1 500		10.0	Merak to Bakauhuni
0210	1020	0120	Cros	Fastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0212	1020	0115	A	Northboun	Cargo	100		6.0	Wooden Shin
0212	1020	0145	Cros	Eastbound	Ferry	1.500		10.0	Bakauhuni to Merak
0214	1020	0200	Cros	Eastbound	Ferry	1,500		10.0	Bakauhuni to Merak
0215	1020	0145	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0216	1020	0200	Cros	Eastbound	Ferry	1,500		10.0	Bakauhuni to Merak
0217	1020	0150	В	Northboun	Cargo	5,000		14.0	
0218	1020	0220	В	Southboun	Cargo	10,000		14.0	
0219	1020	0220	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0220	1020	0220	Α	Southboun	Cargo	15,000		12.0	
0221	1020	0230	Α	Northboun	Cargo	5,000		14.0	
0222	1020	0240	Α	Northboun	Cargo	500		10.0	
0223	1020	0315	Α	Southboun	Cargo	30,000		14.0	
0224	1020	0320	Cros	Westbound	Ferry	1,500		10.0	Merak to Bakauhuni
0225	1020	0345	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0226	1020	0345	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0227	1020	0410	A	Southboun	Cargo	30,000		15.0	
0228	1020	0418	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0229	1020	0420	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0230	1020	0433	A	Northboun	Cargo	4,000		15.0	
0231	1020	0435	В	Southboun	Cargo	2,000		12.0	
0232	1020	0500	A	Southboun	Cargo	400		8.U	Manaly to Dalygb
0233	1020	0512		Southhours	Corre	1,000		10.0	Merak to Bakaununi
0234	1020	0515	A	Northbour	Cargo Fishing Post	10		7.0	
0230	1020	0525	A	Fastbound	Form	1 000		10.0	Bakauhuni to Morak
0230	1020	0525	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0238	1020	0535	Cros	Westhound	Forry	1,000		10.0	Marak to Bakauhuni
0230	1020	0545	R	Southbour	Cargo	200		6.0	
0240	1020	0610	B	Southboun	Cargo	2.000		8.0	
0241	1020	0620	A	Northboun	Cargo	57.017	Bunga Kelana	16.5	Ciracan to Malaysia
0242	1020	0626	B	Southboun	Cargo	4.000	2 ungu iselund	12.0	enably to manayblu
0243	1020	0628	Cros	Westbound	Ferry	1.000		10.0	Merak to Bakauhuni
0244	1020	0630	Cros	Westbound	Ferry	1.000		10.0	Merak to Bakauhuni
0245	1020	0652	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0246	1020	0655	A	Southboun	Cargo	800		10.0	

Seria	Data	Local	Cata	Traffic	Kind of	Gross	Shin's Nome	Speed	Remark (Last Port / Next
1 No.	Date	Time	Gate	Route	Vessel	Ton	Ships Name	Speed	Port)
0247	1020	0715	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0248	1020	0720	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0249	1020	0722	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0250	1020	0730	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0251	1020	0745	Α	Southboun	Tanker	3,747	Sunlight	14.0	Malaysia to Anyer, Indonesia
0252	1020	0800	В	Northboun	Cargo	2,000	<u> </u>	10.0	
0253	1020	0806	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0254	1020	0808	Α	Southboun	Tanker	1,000		10.0	
0255	1020	0810	Cros	Eastbound	Ferry	2,000		10.0	Bakauhuni to Merak
0256	1020	0815	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0257	1020	0820	B	Northboun	Tanker	5,000		10.0	
0258	1020	0824	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0259	1020	0838	Cros	Westbound	Speed Boat	100		25.0	Merak to Bakauhuni
0260	1020	0838	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0261	1020	0843	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0262	1020	0848	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0263	1020	0903	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0264	1020	0906	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0265	1020	0914	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0266	1020	0925	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0267	1020	0930	Cros	Eastbound	Ferry	2,000		10.0	Bakauhuni to Merak
0268	1020	0930	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0269	1020	0935	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0270	1020	0948	В	Southboun	Tanker	17,000	Dewi Sapitri	13.0	Jakarta
0271	1020	0950	Α	Northboun	Cargo	300	•	6.0	
0272	1020	0953	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0273	1020	1000	Cros	Eastbound	Speed Boat	200		20.0	Bakauhuni to Merak
0274	1020	1007	Cros	Eastbound	Ferry	2,000		10.0	Bakauhuni to Merak
0275	1020	1008	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0276	1020	1010	Α	Northboun	Cargo	200		6.0	
0277	1020	1015	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0278	1020	1025	Cros	Westbound	Ferry	2,000		10.0	Merak to Bakauhuni
0279	1020	1032	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0280	1020	1040	Α	Southboun	Cargo	200		6.0	Wooden Ship
0281	1020	1055	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0282	1020	1102	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0283	1020	1110	Α	Southboun	Container	8,960	Pancaran Sinar	15.0	Jalarta tp Panjang LOA140m
0284	1020	1115	Α	Southboun	Cargo	38,000	Adi Guna	12.0	Jakarta to Panjang
0285	1020	1128	Α	Southboun	Cargo	40,000		12.0	
0286	1020	1128	Cros	Westbound	Speed Boat	200		20.0	Merak to Bakauhuni
0287	1020	1132	В	Northboun	Container	5,000		12.0	
0288	1020	1145	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0289	1020	1145	Cros	Eastbound	Speed Boat	100		18.0	Bakauhuni to Merak
0290	1020	1200	Cros	Westbound	Speed Boat	100		18.0	Merak to Bakauhuni
0291	1020	1203	Cros	Eastbound	Speed Boat	100		18.0	Bakauhuni to Merak
0292	1020	1210	Cros	Westbound	Ferry	1,500		10.0	Merak to Bakauhuni
0293	1020	1210	A	Northboun	Tanker	17,500	MT Police Part	10.0	Ciracap to Jakarta LOA160m
0294	1020	1220	Cros	Westbound	Speed Boat	100		18.0	Merak to Bakauhuni
0295	1020	1225	A	Southboun	Tanker	1,000		10.0	
0296	1020	1210	B	Northboun	Cargo	1,000		10.0	
0297	1020	1230	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0298	1020	1230	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni
0299	1020	1230	Cros	Eastbound	Speed Boat	100		18.0	Bakauhuni to Merak
0300	1020	1245	A	Southboun	Tanker	13,500	IBNU	14.0	Balongan to Cilacap
0301	1020	1245	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0302	1020	1245	Cros	Westbound	Speed Boat	100		18.0	Merak to Bakauhuni
0303	1020	1300	Cros	Eastbound	Ferry	1,000		10.0	Bakauhuni to Merak
0304	1020	1300	Cros	Eastbound	Speed Boat	100		18.0	Bakauhuni to Merak
0305	1020	1300	Cros	Westbound	Ferry	1,000		10.0	Merak to Bakauhuni

Appendix 2.4.4. Density Survey Log in Lombok Strait (from 1400hours May 18th to 1400hrs May 20th 2001)

No.	Date	Local Time	Traffic Route	Ship's Name	Kind of Vessel	Gross Ton	LOA(n	Speed	Remark (Last Port / Next Port)
1	0518	1402	Cross to East	Perdana	Ferry	1,645	, 61.36	11.0	Padangbai to
			-	Nusantara					Lembar
2	0518	1430	Cross to West	Marina Segunda	Ferry	836	42.24	9.0	Lembar to Padangbai
3	0518	1450	Badung Strait to South	Bounty Cruise	Ferry	622	44.00	31.0	Meno Isl to Benoa
4	0518	1600	Cross to East	Marina Primera	Ferry	836	42.24	11.0	Padangbai to Lembar
5	0518	1643	Southbound	-	Bulk	58,000	245.00	15.0	- to West Australia
6	0518	1650	Cross to West	Salindo Mutiara I	Ferry	1,002	67.37	15.0	Lembar to Padangbai
7	0518	1750	Cross to West	Satria Pratama	Ferry	1,333	49.85	8.0	Lembar to Padangbai
8	0518	1840	Cross to East	Marina Segunda	Ferry	836	42.24	10.0	Padangbai to Lembar
9	0518	1940	Cross to West	Roditha	Ferry	908	60.37	10.0	Lembar to Padangbai
10	0518	2020	Cross to East	Salindo Mutiara I	Ferry	1,002	63.37	8.0	Padangbai to Lembar
11	0518	2030	Cross to West	Perdana Nusantara	Ferry	1,645	61.36	11.0	Lembar to Padangbai
12	0518	2106	Cross to East	Nusa Sakti	Ferry	1,002	64.15	6.5	Padangbai to Lembar
13	0518	2202	Cross to East	Satria Pratama	Ferry	1,333	49.85	9.0	Padangbai to Lembar
14	0518	2330	Cross to West	Marina Primera	Ferry	836	42.24	11.0	Lembar to Padangbai
15	0518	2340	Cross to East	Roditha	Ferry	908	60.37	10.0	Padangbai to Lembar
16	0519	0120	Cross to West	Marina Segunda	Ferry	836	42.24	10.0	Lembar to Padangbai
17	0519	0245	Cross to East	Perdana Nusantara	Ferry	1,645	61.36	11.0	Padangbai to Lembar
18	0519	0400	Cross to West	Salindo Mutiara I	Ferry	1,002	63.37	9.0	Lembar to Padangbai
19	0519	0420	Southbound	-	Bulk	20,000	170.00	13.5	- to West Australia
20	0519	0425	Cross to East	Marina Primera	Ferry	836	42.24	11.0	Padangbai to Lembar
21	0519	0500	Southbound	-	Bulk	80,000	250.00	15.0	- to West Australia
22	0519	0505	Badung Strait to South	Balito	Ferry	1,502	69.00	35.0	Bima to Benoa
23	0519	0520	Cross to East	Marina Segunda	Ferry	836	42.24	10.0	Padangbai to Lembar
24	0519	0600	Cross to West	Pelangi Nusantara	Ferry	909	49.92	9.0	Lembar to Padangbai
25	0519	0645	Northbound	Ocean Hope 2	Bulk (Salt)	70,429	170.00	12.0	West Aust. To Japan (Nikata)
26	0519	0705	Cross to West	Roditha	Ferry	908	60.37	10.0	Lembar to Padangbai
27	0519	0710	Cross to East	-	Ferry	20	15.00	12.0	Benoa to Lembar
28	0519	0755	Southbound	Sea Maestoro	Bulk	15,880	160.40	16.0	China to West Australia (Albany)
29	0519	0906	Southbound	Navios Mariner	Bulk (ore)	36,540	225.00	14.5	China to West Australia (Port Headland)
30	0519	0910	Southbound	Marchekan	Tanker (Gasoline)	28,322	182.91	13.5	Singa to West Australia (Darwin)
31	0519	0912	Cross to East	Nusa Sejahtera	Ferry	899	53.09	12.0	Padangbai to Lembar
32	0519	1015	Cross to West	Perdana Nusantara	Ferry	1,645	61.36	11.0	Lembar to Padangbai
Appendix 2.4.4. Density Survey Log in Lombok Strait (from 1400hours May 18th to 1400hrs May 20th 2001)

N۵	Date	Local	Traffic Route	Shin's Name	Kind of	Grass	LΟΔ(m	Sneed	Remark (Last Port /
	Date	Time	LI allit Noule		Vessel	Ton		Sheen	Next Port)
33	0519	1020	Cross to East	Pelangi Nusantara	Ferry	909	49.92	9.0	Padangbai to Lembar
34	0519	1100	Cross to East	Roditha	Ferry	908	60.37	10.0	Padangbai to Lembar
35	0519	1315	Northbound	Diamond Bulker	Bulker (Salt)	16,721	169.00	9.7	West Aust to Surabaya
36	0519	1315	Northbound	8504	Fishing Boat	300	40.00	12.0	Indian Ocean to -
37	0519	1400	N orthbound	Torn Cristina	Tanker	57,080	244.00	12.0	Saudi Arabia to
					(Crude Oil)				Indonesia Situbondo
38	0519	1445	Cross to West	Nusa Sakti	Ferry	1,002	64.15	11.5	Lembar to Padangbai
39	0519	1500	Cross to East	Marina Primera	Ferry	836	42.24	10.5	Padangbai to Lembar
40	0519	1515	Northbound	Diamond Queen	Bulker	57,947	246.80	13.0	West Aust to Singanore
41	0519	1600	Cross to West	Satria Pratama	Ferry	1,333	49.85	9.0	Lembar to Padangbai
42	0519	1635	Cross to East	Perdana Nusantara	Ferry	1,645	61.36	11.0	Padangbai to Lembar
43	0519	1720	Cross to West	Roditha	Ferry	908	60.37	10.0	Lembar to Padangbai
44	0519	1800	Badung Strait to South	Serayu	Ferry	1,502	68.80	35.0	Bima to Benoa
45	0519	1925	Cross to West	Marina Segunda	Ferry	836	42.29	9.5	Lembar to Padangbai
46	0519	1930	Cross to East	Nusa Sakti	Ferry	1,002	64.15	11.5	Padangbai to Lembar
47	0519	2025	Cross to East	Satria Pratama	Ferry	1,333	49.85	9.0	Padangbai to Lembar
48	0519	2058	Northbound	James M. Saliban	Tanker (Crude Oil)	80,914	258.90	12.4	Nigeria Bonny to Indonesia Balikpapan
49	0519	2201	Cross to East	Roditha	Ferry	908	60.37	10.0	Padangbai to Lembar
50	0519	2205	Badung Strait to North	Serayu	Ferry	1,502	68.80	30.2	Benoa to Bima
51	0519	2210	Cross to West	Marina Premera	Ferry	836	42.24	10.5	Lembar to Padangbai
52	0519	2310	Cross to East	Marina Segunda	Ferry	836	42.29	9.5	Padangbai to Lembar
53	0519	2348	Cross to West	Perdana Nusantara	Ferry	1,645	61.36	11.0	Lembar to Padangbai
54	0520	0002	Southbound	Selendang Sari	Tanker (Crude Oil)	29,956	182.00	17.2	Indonesia Situbondo to Yambuu
55	0520	0130	Cross to East	Marina Premera	Ferry	836	42.24	10.5	Padangbai to Lembar
56	0520	0135	Cross to West	Nusa Sejahtera	Ferry	899	53.09	10.5	Lembar to Padangbai
57	0520	0230	Southbound	Daebo Gemma	Bulker	13,081	156.00	15.0	Surabaya to West Australia (Albany)
58	0520	0345	Cross to East	Perdana Nusantara	Ferry	1,645	61.36	11.0	Padangbai to Lembar
59	0520	0440	Cross to West	Pelangi Nusantara	Ferry	909	49.92	10.0	Lembar to Padangbai
60	0520	0535	Cross to East	Nusa Bhakti	Ferry	676	44.00	9.5	Padangbai to Lembar
61	0520	0555	Cross to West	Nusa Sakti	Ferry	1,002	64.15	11.5	Lembar to Padangbai

Appendix 2.4.4. Density Survey Log in Lombok Strait (from 1400hours May 18th to 1400hrs May 20th 2001)

No.	Date	Local Time	Traffic Route	Ship's Name	Kind of Vessel	Gross Ton	LOA(n)	Speed	Remark (Last Port / Next Port)
62	0520	0630	Northbound	Treasure Sea	Bulk (Ore)	74,966	283.00	9.0	West Aust (Dampier)to China
63	0520	0655	Cross to East	Nusa Sejahtera	Ferry	899	53.09	10.5	Padangbai to Lembar
64	0520	0750	Cross to West	Satria Pratama	Ferry	1,333	49.85	9.0	Lembar to Padangbai
65	0520	0810	Cross to East	Pelangi Nusantara	Ferry	909	49.92	10.0	Padangbai to Lembar
66	0520	0900	Cross to West	Marina Primera	Ferry	836	42.24	10.5	Lembar to Padangbai
67	0520	1010	Cross to East	Nusa Sakti	Ferry	1,002	64.15	11.5	Padangbai to Lembar
68	0520	1100	Badung Strait to North	Bunty	Ferry	622	44.00	25.0	Benoa to Gilimeno
69	0520	1135	Badung Strait to North	Klau Tons	Tanker (Gasoline)	1,670	105.00	12.0	Benoa to Amduan
70	0520	1140	Cross to West	Perdana Nusantara	Ferry	1,645	61.36	11.0	Lembar to Padangbai
71	0520	1140	Cross to East	Satria Pratama	Ferry	1,333	49.85	9.0	Padangbai to Lembar
72	0520	1300	Cross to East	Marina Primera	Ferry	836	42.24	10.5	Padangbai to Lembar
73	0520	1335	Cross to West	Nusa Penida	Ferry	649	48.49	10.0	Lembar to Padangbai
74	0520	1400	Northbound	-	Bulker	35,000	190.00	15.0	West Aust to -

Appendix 2.4.5	. ULCC Particular	List (as of	August 11, 2001)
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			Build	Build		GRT		Draft	Beam
Ship's name	Flag	Reg. Port	Country	Year	DWT (mt)	(mt)	LOA (m)	(m)	(m)
Atlantic Blue	Panama	Panama	UK	1978	338,014	162,048	367.22	22.54	55.40
Auriga	Liberia	Monrovia	Japan	1976	410,590	203,043	378.01	22.97	69.00
Berge Banker	Norway	Stavanger	Portugal	1979	323,092	153, 124	346.21	22.35	57.31
Berge Ingerid	Norway	Stavanger	Sweden	1977	357,345	169,752	362.62	22.36	60.01
Chevron South America	Bermuda	Hamilton	Japan	1976	413,160	198,951	365.87	22.90	70.01
Eaton	Liberia	Monrovia	Sweden	1977	357,023	170,520	362.49	22.33	60.00
Empress Des Mers	Bahamas	Nassau	Japan	1976	423,677	203,110	381.82	22.78	68.01
Essex	Liberia	Monrovia	Sweden	1975	362,118	168,955	362.75	22.30	60.00
Hellespont Capitol	Greece	Piraeus	Japan	1976	381,913	187,421	373.52	22.92	64.01
Hellespont Embassy	Marshall Islands	Majuro	Japan	1976	413,012	199,210	366.00	20.32	70.01
Hellespont Grand	Marshall Islands	Majuro	Japan	1976	421,681	201,658	378.00	22.92	69.00
Hellespont Paramount	Marshall Islands	Majuro	Japan	1977	375,868	187,421	373.52	22.92	64.01
Jahre Pollux	Norway	Sandefjord	Sweden	1976	357,128	168,380	362.59	22.35	60.00
Jahre Viking	Norway	Sandefjord	Japan	1976	564,763	260,851	458.45	24.61	68.86
Kapetan Giannis	Greece	Piraeus	Japan	1977	516,893	247,160	406.59	25.29	71.01
Kapetan Giorgis	Greece	Piraeus	Japan	1976	456,368	218,447	378.39	25.02	68.00
Kapetan Hatzis	Greece	Piraeus	Japan	1976	412,595	198,427	365.87	22.90	70.01
Kapetan Hiotis	Greece	Piraeus	Japan	1977	413,098	198,534	365.87	22.90	70.00
Kapetan Michalis	Greece	Piraeus	Japan	1977	516,423	247,169	406.60	25.29	71.01
Kapetan Panagiotis	Greece	Piraeus	Japan	1977	457,062	218,447	378.39	25.04	68.01
Kraka	Bahamas	Nassau	Sweden	1978	357,599	169,401	362.59	22.36	60.00
Marine Atlantic	Liberia	Monrovia	USA	1979	404,531	192,707	362.14	22.81	69.50
Media Star	Liberia	Monrovia	Japan	1977	411,508	199,172	362.01	22.34	70.01
Mira Star	Liberia	Monrovia	Japan	1976	423,642	202,881	378.01	22.97	68.99
Olympia Spirit	Gibraltar	Gibraltar	Japan	1976	406,258	200,598	362.01	22.22	70.01
Pacific Blue	Panama	Panama	Japan	1977	413,842	199,430	365.85	22.91	70.00
Sahara	Liberia	Monrovia	Sweden	1974	356,400	168,524	362.75	22.32	60.00
Arctic Blue	Panama	Panama	Japan	1975	484,276	234,287	378.85	28.20	62.01
Sea Giant	Bahamas	Nassau	Frannce	1979	554,982	261,453	414.23	28.60	63.01
Sea Splendour	Bahamas	Nassau	Sweden	1978	409,400	188,947	381.92	23.38	63.25
Sea World	Bahamas	Nassau	Sweden	1978	491,120	237,768	364.02	24.00	79.00
Skyros	Greece	Piraeus	Sweden	1976	323,097	153,027	346.23	22.34	57.31
Stavros G. L.	Greece	Not Known	Sweden	1976	357,054	167,349	362.75	22.32	60.00
Stena Companion	Bermuda	Hamilton	Sweden	1977	357,023	169,593	362.49	22.35	60.00
Stena King	Bermuda	Hamilton	Taiwan	1978	457,927	218,593	378.42	25.03	68.00
Stena Queen	Bermuda	Hamilton	China	1977	457,841	218,593	378.42	25.04	68.00
Berge Enterprise	France	Kerguelen	Japan	1981	360,700	188,728	340.52	23.23	65.00
Berge Nisa	Norway	Stavanger	Portugal	1983	$\overline{322,912}$	$1\overline{53,517}$	346.26	22.35	57.31
Berge Pioneer	Norway	Stavanger	Japan	1980	360,700	188,728	340.50	23.23	65.00
Marine Pacific	Liberia	Monrovia	USA	1980	404,531	192,707	362.09	22.84	69.50
Settebello	Liberia	Monrovia	Portugal	1983	$322,44\overline{6}$	152,374	346.24	22.22	57.31

Source: Tanker World Internet Home Page (www.tankerworld.com/vessels/vessel_search.htm)

Appendix 2.4.6. ULCC Chartering Condition (as of August 11, 2001)

Allantic Blue 01 May 200 [23 May 200] Sign May 200 [29 May 200] Kinarg Island Sterz SH9LL Atlantic Blue 10 Feb 2001 [25 Mar 2001] 200K Kinarg Island Sterz TUPRAS Atlantic Blue 10 Feb 2001 [25 Mar 2001] 200K Kinarg Island Sterz TUPRAS Atlantic Blue 10 Feb 2001 [25 Mar 2000] 200K Kinarg Island Red Sea SARAS Atlantic Blue 18 Oct 2000 [08 Nov 2000] 200K Mina Qaboos Fugliarah MASE/HILD Atlantic Blue 18 Oct 2000 [08 Nov 2000] 200K Mina Qaboos Fugliarah MASE/HILD Atlantic Blue 13 Out 2001 [05 Aug 2001] 13 KK Raz Tanura US Gulf CHAVKON Berge Banker 13 Jul 2001 [05 Aug 2001] 200K [28 KK Karag Island Red Sea ACIP Concordia 18 Apr 2001 [04 May 2001] 200K [28 KK Karad Fland Rotterdam ST.A.S.C.O. Concordia 24 Oct 2000 [17 Nov 2000] 270K [Areandria Rotterdam ST.A.S.C.O. Concordia 24 Oct 2000 [16 Avg 200] 200 [20 KK West Africa Rodfa I O C Eaton 10	Ships name	Reported	Laycan	Cargo	Load Port	Discharge Port	Charterer
Atlantic Bite 20 2001 25 Margeneric Disk Disk <thdisk< th=""> Disk <thdisk< th=""></thdisk<></thdisk<>	Atlantic Blue	01 May 2001	23 May 2001	330K	Mina Al Bakr	Red Sea	SHFI I
Attantic Blue 28 Pb/ 2001 25 Mar 2001 2000 [Kharg Liand] Sacs TTPPAKS Atlantic Blue 09 Nov 2000 276 K/v2000 2706 K/rabian Gulf EAST SIRAS Atlantic Blue 28 Ox 2000 2706 K/rabian Gulf EAST SIRAS Ox Atlantic Blue 18 Ox 2000 2706 K/rabian Gulf EAST SIRAS Ox Atlantic Blue 13 Ox 2000 2706 K/rabian Gulf EVEX TUPRAS Berge Banker 13 Jul 2001 16 Ro 2000 2706 K/rabian Gulf FUE ATS CHEVRON Berge Banker 13 Jul 2001 OX Aug 2000 2706 K/rabian Gulf North Europe STAS.C.O. Concordia 18 Apr 2001 2 Aug 2000 2706 K/rabian Gulf North Europe STAS.C.O. Concordia 24 Oct 2000 1 Fox 2000 2 Stas K/rabian Gulf North Europe STAS.C.O. Cancordia 24 Oct 2000 1 Fox 2001 2000 2 Stas C.O. Cancordia North Aug Stas C.O. Eaton 10 Jar 2001 10 Fob 2001	Atlantic Blue	30 Apr 2001	15 May 2001	200K	Mina Al Bakr	US Culf	BAVOII
Adminic Blue Of Feb 2001 23 Feb 2001 280K Kinard Liand Red Sea SARS Atlantic Blue 00 Nov 2000 27 Nov 2000 270K Araban Guif EAST ST.A.S.C.O. Atlantic Blue 18 Oct 2000 08 Nov 2000 270K Araban Guif EAST ST.A.S.C.O. Atlantic Blue 18 Oct 2000 08 Nov 2000 260K Kharg Island Sucz TUPRAS Berge Banker 13 Jan 2001 18 Feb 2001 210K Ras Tanura US Guif CHENKON Berge Ingerint 13 Nov 2000 23 Dec 2000 270K Havahan Guif NovE CHENKON Concordia 09 Jan 2001 18 Feb 2001 270K Havahan Guif NovE ST.A.S.C.O. Concordia 28 Nov 2000 21 Dec 2000 270K Havandria North Europe ST.A.S.C.O. Concordia 24 Ovel 020 17 Nov 2000 2000 18 Aveandria North Europe ST.A.S.C.O. Concordia 24 Ovel 020 17 Nov 2000 2000 13 Nov Evel 14 Novel 14 North Europe ST.A.S.C.O. Concordia 24 Ovel 020 11 Ave 2001 2000 13 Nov Evel 14 Novel 14 Novel 14 Novel 10 Novel 10 Novel 13 Nove	Atlantic Blue	28 Feb 2001	25 Mar 2001	200K	Kharg Island	Suez	TUPRAS
Admits Bits Obs. Value 2000 270K Arabian Guir EXST STAESCO Atlantic Blue 18 Oct 2000 18 Nov 2000 270K Arabian Guir EXST STAESCO Atlantic Blue 18 Oct 2000 18 Nov 2000 300K Kharg Island Suze TUPRAS Berge Banker 13 Jul 2001 16 Re 2001 210K Arabian Guir US Guil CHEVRON Berge Banker 13 Jul 2001 300K Kharg Island Not DI Co(ICO) ChEVRON Concordia 18 Apr 2001 2001 210K Karardra North Europe STA.S.C.O. Concordia 28 Nov 2000 210R 200K Marandra North Europe STA.S.C.O. Concordia 24 Oct 2000 17 Nov 2000 200K Marandra Reterdam STA.S.C.O. Concordia 24 Oct 2000 2000 2000 200K Marandra Reterdam STA.S.C.O. Eaton 10 Jan 2001 10 Feb 2001 200K Mara Bakr US culf GUINORO <tr< td=""><td>Atlantic Blue</td><td>01 Feb 2001</td><td>23 Feb 2001</td><td>260K</td><td>Kharg Island</td><td>Red Sea</td><td>SARAS</td></tr<>	Atlantic Blue	01 Feb 2001	23 Feb 2001	260K	Kharg Island	Red Sea	SARAS
Atlantic Blue 26 Oct 2000 98 Nov 2000 260K Mina Qaboos Fujairah MASETED Atlantic Blue 18 Oct 2000 88 Nov 2000 300K Kiarg Island Suez TUPPAS Berge Banker 13 Jul 2001 105 Aug 2001 275K Arabian Culf US Culf CHEVRON Berge Ingerid 13 Nov 2000 270K Arabian Culf North Europe ST.A.S.C.O. Concordia 28 Nov 2000 170K Arabian Culf North Europe ST.A.S.C.O. Concordia 24 Nov 2000 170K Arabian Culf North Europe ST.A.S.C.O. Concordia 24 Nov 2000 100 2001 200K West Anfria Kandla 1.0 C Eaton 16 Arg 2001 16 Arg 2001 260K West Africa India INDIAN OIL COHOC) Eaton 03 Nov 2000 10 Feb 2001 260K West Africa India INDIAN OIL COHOC) Eaton 03 Nov 2000 10 Feb 2001 260K West Africa India INDIAN OIL COHOC)	Atlantic Blue	09 Nov 2000	27 Nov 2000	270K	Arabian Gulf	FAST	STASCO
Attantic Bloc 18 Oct 2000 08 Nov 2000 300K Kharg Island Support TUPRAS Berge Banker 13 Jul 2001 05 Aug 2001 275K Arabian Guif US Guif CHEVRON Berge Banker 13 Jul 2001 18 Feb 2001 310K Ras Tanura US Guif VELA Berge Ingerid 13 Nov 2000/23 Dec 2000 270K Kas Tanura US Guif VELA Concordia 09 Jan 2001 03 Feb 2001 270K Krabian Guif North Europe S.T.A.S.C.O. Concordia 24 Oct 2000 17 No 2000 290K Alexandria North Europe S.T.A.S.C.O. Cancordia 24 Oct 2000 17 No 2000 290K Alexandria North Europe S.T.A.S.C.O. Eaton 10 May 200102 2001 260K Port Harcourt Kandla 10 C Eaton 0.10 Jan 2001 10 Feb 2001 260K Port Harcourt India INDIA NOIL COffOC Eaton 0.3 Nov 20000 07 Dec 2000 260K West Africa India INDIAN OIL COffOC	Atlantic Blue	26 Oct 2000	08 Nov 2000	260K	Mina Oaboos	Fujairah	MASEFIELD
Berge Banker 13 Jul 2001 06 Aug 2001 275K Arabian Guif CHEVRON Berge Ingerich 13 No 2001 18 Feb 2001 310K Ras Tanura US Guif CHEVRON Berge Ingerich 13 Nov 200023 Dec 2000 270K Port Harcourt India INDIAN OIL CO(IOC) Concordia 09 Jan 2001 05 Feb 2001 270K Arabian Guif North Europe S.T.A.S.C.O. Concordia 24 Nov 2000 21 Dec 2000 275K Alexandria North Europe S.T.A.S.C.O. Concordia 24 Nov 2000 21 Dec 2000 275K Alexandria North Europe S.T.A.S.C.O. Eaton 10 Jan 2001 16 Aug 2001 200K Mina Al Bakr US Guiff GUNVOR Eaton 10 Jan 2001 16 Aug 2001 200K Port Harcourt India INDIAN OIL CO(IOC) Eaton 03 Nov 2000 10 Dec 2000 260K West Africa India INDIAN OIL CO(IOC) Eaton 03 Nov 2000 00 Dec 2000 260K Kharg Island Red Sea <td>Atlantic Blue</td> <td>18 Oct 2000</td> <td>08 Nov 2000</td> <td>200K</td> <td>Kharg Island</td> <td>Suez</td> <td>TUPRAS</td>	Atlantic Blue	18 Oct 2000	08 Nov 2000	200K	Kharg Island	Suez	TUPRAS
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Berge Ingerid 13 Nov 2000 23 Dec 2000 270K Part Harcourt India INDIAN OIL CO(IOC) Concordia 16 Apr 2001 04 May 2001 280K Kharg Island Red Sea AGE) Concordia 09 Jan 2001 03 Feb 2001 270K Arabian Cull' North Europe S.T.A.S.C.O. Concordia 24 Oct 2000 17 Nov 2000 290K Alexandria North Europe S.T.A.S.C.O. Cancordia 24 Oct 2000 17 Nov 2000 290K Alexandria North Europe S.T.A.S.C.O. Eaton 10 Jan 2001 10 Feb 2001 260K Port Harcourt Kandla I O C Eaton 10 Jan 2001 10 Feb 2001 260K Port Harcourt India INDIAN OIL CO(IOC) Eaton 10 Jan 2001 10 Feb 2001 260K Port Harcourt India INDIAN OIL CO(IOC) Eaton 10 Jan 2001 11 6 Aug 2001 280K Port Harcourt India INDIAN OIL CO(IOC) Eaton 10 Jan 2001 11 6 Aug 2001 280K Port Harcourt India INDIAN OIL CO(IOC) Eaton 19 Jal 2001 16 Aug 2001 2001 280K <td< td=""><td>Berge Banker</td><td>30 Jan 2001</td><td>18 Feb 2001</td><td>210H</td><td>Ras Tanura</td><td>US Gulf</td><td>VFLA</td></td<>	Berge Banker	30 Jan 2001	18 Feb 2001	210H	Ras Tanura	US Gulf	VFLA
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Essex03Nov 200009Dec 2000280KWest AfricaIndiaINDIAN OIL $CO(IOC)$ Hellespont Embassy18May 200117Jun 2001330KKharg IslandRed SeaSARASHellespont Embassy23Feb 200115Mar 2001385KArabian GulfUS GulfCHEVRONHellespont Embassy23Feb 200101Aug 2001400KArabian GulfUS GulfCHEVRONHellespont Grand16Feb 200110Mar 2001400KArabian GulfUS GulfEXXON MOBILHellespont Grand03Nov 200008Dec 2000400KArabian GulfUS GulfCHEVRONHellespont Grand03Nov 200028Nov 2000400KArabian GulfUS GulfCHEVRONHellespont Grand24Oct 20012820001342KMina Al BakrUS GulfCHEVRONHellespont Paramoul16Mar 2001342KMina Al BakrUS GulfCHEVRONHellespont Paramoul16Mar 2001350KAlexandriaRotterdamST.A.S.C.O.Hellespont Paramoul16Mar 2001350KAlexandriaRotterdamST.A.S.C.O.Hellespont Paramoul16Mar 2001130KArabian GulfUS GulfVELAJahre Politu08Dec 2000380KRas TanuraUS GulfVELAKapetan Giannis05Jun 2001150KArabian GulfUS GulfVELAKapet	Essex	06 Nov 2000	05 Dec 2000	260K	West Africa	India	INDIAN OIL CO(IOC)
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Kapetan Plotts19 Oct 200020 Nov 2000403KArabian GulfUS GulfVELAKapetan Panagiotis06 Nov 200010 Dec 2000450KArabian GulfUS GulfVELAMarine Atlantic23 Jul 200131 Jul 2001385KArabian GulfUS GulfEXXON MOBILMarine Atlantic20 Mar 200121 Apr 2001390KArabian GulfUS GulfEXXON MOBILMarine Atlantic20 Dec 200023 Jan 2001395KRas TanuraUS GulfEXXON/MOBILMarine Atlantic19 Oct 200006 Nov 2000395KArabian GulfUS GulfCHEVRONPaciffic Blue18 Apr 200110 May 2001400KRas TanuraUS GulfEXXON/MOBILPaciffic Blue11 Jan 200101 Feb 2001400KArabian GulfUS GulfEXXON/MOBILSahara16 Jul 200111 Aug 2001330KKharg IslandRed SeaSARASSahara21 Mar 200122 Apr 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARAS	Kapetan Hiatis	19 Oct 2000	15 Nov 2000	400K	Archion Culf	US Gulf	
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Marine Attantic15 Oct 200010 Nov 2000353KArabian GullUS GullCHEVRONPaciffic Blue18 Apr 200110 May 2001400KRas TanuraUS GulfEXXON MOBILPaciffic Blue11 Jan 200101 Feb 2001400KArabian GulfUS GulfEXXON/MOBILSahara16 Jul 200111 Aug 2001330KKharg IslandRed SeaSARASSahara23 May 200110 Jun 2001325KMina Al BakrUS GulfBAYOILSahara21 Mar 200122 Apr 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASArctic Blue09 Apr 200127 Apr 2001400KArabian GulfUS GulfCHEVRON	Marine Atlantic	10 Oct 2000	6 Nov 2000	205V	Arabian Culf	US Culf	CUEVDON
Pacific Blue11 Jan 200101 Feb 2001400KArabian GulfUS GulfEXXON MOBILSahara16 Jul 200111 Aug 2001330KKharg IslandRed SeaSARASSahara23 May 200110 Jun 2001325KMina Al BakrUS GulfBAYOILSahara21 Mar 200122 Apr 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASArctic Blue09 Apr 200127 Apr 2001400KArabian GulfUS GulfCHEVRON	Paciffic Rhuo	13 Oct 2000	10 May 2000	100V	Ras Tanura	US Culf	FYYON MORI
Sahara16 Jul 200111 Aug 2001330KKharg IslandRed SeaSARASSahara23 May 200110 Jun 2001325KMina Al BakrUS GulfBAYOILSahara21 Mar 200122 Apr 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASArctic Blue09 Apr 200127 Apr 2001400KArabian GulfUS GulfCHEVRON	Paciffic Rhuo	11 Jan 9001	10 may 2001	100K	Arabian Culf	US Culf	EAAON WODIL FYYON/MORI
Sahara23 May 200111 Aug 2001330KKharg IslandRed SeaSARASSahara23 May 200110 Jun 2001325KMina Al BakrUS GulfBAYOILSahara21 Mar 200122 Apr 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASArctic Blue09 Apr 200127 Apr 2001400KArabian GulfUS GulfCHEVRON	sahara	16 Jul 2001	11 Aug 2001	300K	Kharg Island	Rod Soz	CADAC
Sahara21 Mar 200122 Apr 2001340KKharg IslandSuezSARASSahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASArctic Blue09 Apr 200127 Apr 2001400KArabian GulfUS GulfCHEVRON	Sallala Sahara	23 May 2001	10 Jun 2001	330K	Mina Al Paler	US Culf	BAVOII
Sahara23 Feb 200120 Mar 2001340KKharg IslandSuezSARASArctic Blue09 Apr 200127 Apr 2001400KArabian GulfUS GulfCHEVRON	Sahara	21 Mar 2001	22 Anr 2001	3/01	Kharg Jeland	Suez	SARAS
Arctic Blue 09 Apr 2001 27 Apr 2001 400K Arabian Gulf US Gulf CHEVRON	Sahara	23 Feb 2001	20 Mar 2001	340K	Kharg Island	Suez	SARAS
	Arctic Blue	09 Apr 2001	27 Apr 2001	400K	Arabian Gulf	US Gulf	CHEVRON

Appendix 2.4.6. ULCC Chartering Condition (as of August 11, 2001)

Ships name	Reported	Laycan	Cargo Size	Load Port	Discharge Port	Charterer
Arctic Blue	21 Mar 2001	13 Apr 2001	400K	Arabian Gulf	Red Sea	SHELL
Arctic Blue	05 Dec 2000	29 Dec 2000	335K	Arabian Gulf	US Gulf	CHEVRON
Arctic Blue	19 Oct 2000	22 Nov 2000	450K	Arabian Gulf	North Europe	S.T.A.S.C.O.
Sea Splendour	25 Oct 2000	28 Nov 2000	400K	Ras Tanura	US Gulf	VELA
Skyros	14 Mar 2001	07 Apr 2001	280K	Mina Al Bakr	US Gulf	BAYOIL
Skyros	23 Feb 2001	12 Mar 2001	270K	Ceyhan	US Gulf	BAYOIL
Stavros G.L.	23 Mar 2001	07 Apr 2001	325K	Arabian Gulf	US Gulf	BAYOIL
Stavros G.L.	19 Feb 2001	03 Mar 2001	300K	Kharg Island	Suez	TUPRAS
Stavros G.L.	02 Feb 2001	07 Mar 2001	270K	Arabian Gulf	Busan	LG CALTEX
Stavros G.L.	27 Dec 2000	22 Jan 2001	300K	Ras Tanura	Red Sea	VELA
Stavros G.L.	05 Dec 2000	19 Dec 2000	300K	Kharg Island	Suez	TUPRAS
Stena Companion	23 Jul 2001	07 Aug 2001	325K	Arabian Gulf	US Gulf	BAYOIL
Stena Companion	21 Nov 2000	28 Dec 2000	350K	Ras Tanura	US Gulf	VELA
Stena Queen	04 Jul 2001	29 Jul 2001	440K	Ras Tanura	US Gulf	VELA
Stena Queen	13 Dec 2000	14 Jan 2001	450K	Ras Tanura	US Gulf	EXXON/MOBIL
Tina	18 May 2001	29 May 2001	325K	Mina Al Bakr	US Gulf	BAYOIL
Tina	25 Oct 2000	29 Nov 2000	355K	Arabian Gulf	Red Sea	EXXON/MOBIL
Berge Nisa	11 Jul 2001	31 Jul 2001	270K	North Sea	US Gulf	EXXON
Berge Nisa	09 May 2001	30 May 2001	285K	Ras Tanura	US Gulf	VELA
Berge Nisa	16 Mar 2001	30 Mar 2001	260K	Norway	North Europe	NAVION
Berge Nisa	02 Jan 2001	26 Jan 2001	285K	Ras Tanura	US Gulf	VELA
Berge Nisa	21 Dec 2000	23 Jan 2001	270K	Arabian Gulf	Korea	HYUNDAI
Berge Nisa	31 Oct 2000	04 Nov 2000	300K	Arabian Gulf	Japan	NIPPON RYOYO
Marine Pacific	13 Nov 2000	22 Dec 2000	390K	Arabian Gulf	US Gulf	EXXON/MOBIL
Settebello	20 Jul 2001	08 Aug 2001	290K	Mina Al Bakr	US Gulf	BAYOIL
Settebello	18 Jun 2001	03 Jul 2001	285K	Ras Tanura	Suez	EXXON MOBIL
Settebello	18 Jun 2001	20 Jul 2001	280K	Yanbu	Suez	EXXON MOBIL
Settebello	10 Jan 2001	20 Jan 2001	295K	Mina Al Bakr	US Gulf	BAYOIL LIMITED
Settebello	18 Oct 2000	10 Nov 2000	290K	Mina Al Bakr	US Gulf	BAYOIL LIMITED

Source: Tanker World Internet Home Page (www.tankerworld.com/companies/charterer_search.htm)

Appendix 2.4.7. Density Survey Log in Maluku Sea of Sea Lane III

Seri al No.	Date	Local Time	Traffic Route	Distance from Sea-	Ship's Name	Kind of Vessel	Gross Ton	LOA(m)	Speed	Remark (Last Port / Next Port)
1	1013	1245	*Crossing	-	TB. Pompong	Towing Vessel	179	25.55	3.1	Ternate (Indonesia) to Bitung (Indonesia), Towed 2,135 GWT Barge with Fuel
2	1013	1715	Northbound	0	Palmstar Thistle	Tanker	57,450	244.00	14.8	Elang Oil Field (Indonesia) to Okinawa (Japan)
3	1013	2050	Northbound	10' W	Kochi Ace	Cargo	7,633	113.22	13.0	Malili, South Slawesi (Indonesia) to Tokyo(Japan)
4	1014	0110	Southbound	5' W	Dyna Germany	Bulk(Ballast)	****	273.00	****	Hong Kong (China) to Dampier(Aust)
5	1014	0250	Northbound	12' E	-	Bulk	80,000	280.00	14.0	**Australia to Japan
6	1014	0520	Southbound	3' W	Ohgishima	Bulk(Ballast)	*****	289.00	****	Fukuyama (Japan) to Port Headland (Aust)
7	1014	0915	Southbound	0	Nitaka Maru	Bulk(Ballast)	*****	289.80	***	Higashi-harima(Japan) to Port Headland (Aust)
8	1014	1158	Northbound	12' W	Ocean Champion	Bulk(Ore)	101,222	300.00	12.5	Port Dampier (Aust) to Kimitsu (Japan)
9	1014	1330	Northbound	25' W	-	Bulk	80,000	280.00	14.0	**Australia to China
10	1014	1610	Northbound	8' W	Mona River	Bulk	85,888	287.60	14.5	Port Headland (Aust) to Hiroshima (Japan)
11	1014	1745	Northbound	2' E	Xinshenghai	Bulk(Ore)	93,310	290.00	12.0	Port Headland (Aust) to China
12	1014	2108	Southbound	21W	-	Bulk		290.00	***	**China to Australia
13	1015	0130	Northbound	0	William	Cargo	15,800	152.06	13.0	Kwinana (Aust) to Japan
14	1015	0500	Northbound	20' W	Koopera Syilya	Bulk	31,649	216.00	13.0	Australia to China
15	1015	1155	*Crossing	-	-	Cargo	300	40.00	8.0	Bitung (Indonesia) to Ternate (Indonesia) **Marked Route:
										mannea would.

Survey Period: From 1200hours Oct. 13th through 1200hrs Oct. 15th 2001 Survey Area: Sea Lane III, at Maluku Sea between Mayu Island and Halmahera

 $\ensuremath{^*\text{Crossing}}$ Vessel in the

vicinity of survey area

Estimated from their

sea trails

				Tanker	1
		Northbound	9	Bulker	6
Sea Lane III, Maluku Sea between	Total 13 Voccole			Cargo Boat	2
Mayu Island and Halmahera	TOTAL 12 ACOUNT			Tanker	0
		4	Bulker	4	
				Cargo Boat	0
		Constant		Bunker	1
		Crossing	2	Barge	1
In the Vicinity of above area	Total 2 Vessels	Vessel		Cargo	1
in the training of these their	The Prober			Doot	-
		Local Fishing	0		
		Boat	3		
	Grand Total 15 Vessels				

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Arktis Ace	2815	89	Container	2000/7/12	Dili. East Timor	IIIB2	Singapore, Singapore	Lombok-Karimata
Arktis Ace	2815	89	Container	2000/7/29	Dili Fast Timor	IIIB2	Singapore Singapore	Lombok-Karimata
Arktis Aco	2815	89	Container	2000/8/13	Dili East Timor	IIIB2	Singapore, Singapore	Lombok-Karimata
Arlatia Are	2015	00	Container	2000/8/13	Dili, Edst Timor	IIID2	Singapore, Singapore	Lombok-Karimata
Arkus Ace	2015	09	Container	2000/8/29	Dill, East Timor	HIDA	Singapore, Singapore	LUIIDOK-Kariiliata
Arktis Ace	2815	89	Container	2000/9/14	Dill, East Timor	IIIB2	Dill, East Timor	IIIB2
Arktis Ace	2815	89	Container	2000/10/4	Dill, East Timor	IIIB2	Dill, East Timor	IIIBZ
Arktis Atlantic	2815	89	Container	2000/7/8	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/7/15	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/7/23	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/7/31	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/8/5	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/8/12	Dili. East Timor	IIIB2	Dili. East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/8/14	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/8/19	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/8/26	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/9/2	Dili Fast Timor	IIIB2	Dili Fast Timor	IIIB2
Arktis Atlantic	2815	80	Container	2000/9/2	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Arktic Atlantic	2015	80	Container	2000/9/10	Dili, East Timor	IIID2 IIID2	Dili East Timon	IIID2 IIID2
Anktis Atlantic	2015	00	Container	2000/0/02	Dili, Edst Timor	IIID2	Dili, East Timor	HID2 HID9
	2015	09	Container	2000/9/22	Dill, East Timor	IIID2	Dill, East Timor	IIID2
Arktis Atlantic	2815	89	Container	2000/9/30	Dill, East Timor	IIIB2	Dill, East Timor	IIIBZ
Arktis Atlantic	2815	89	Container	2000/10/6	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/10/14	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/10/21	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/10/28	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/11/3	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/11/11	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/11/17	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/11/25	Dili, East Timor	IIIB2	Dili. East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/12/1	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/12/9	Dili Fast Timor	IIIB2	Dili Fast Timor	IIIB2
Arktis Atlantia	2815	89	Container	2000/12/3	Dili Fast Timor	JIIR9	Dili Fast Timor	JIIR9
Anktic Atlanti-	2010 2015	80	Container	2000/12/10 2000/12/17	Dili East Timor	HID2 HID2	Dili East Timor	HID2 HID9
Arkus Atlantic	2015	69 90	Container	2000/12/15	Dill, East Timor	IIIBZ	Dill, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2000/12/23	Dilli, East Timor	111B2	Diff, East Timor	111B2
Arktis Atlantic	2815	89	Container	2000/12/30	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/1/6	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/1/31	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/2/2	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/2/10	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/2/16	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/2/23	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/3/4	Dili Fast Timor	IIIB2	Dili Fast Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/3/10	Dili East Timor	IIIB2	Dili Fast Timor	IIIB2
Arktis Atlantic	2815	80	Container	2001/3/10	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Anktis Atlantic	2015	00	Container	2001/3/17	Dili, East Timor	IIID2 IIID2	Dili East Timon	IIID2 IIID2
Arkus Atlantic	2015	09	Container	2001/3/24	Dili, East Timor	IIID2	Dill, East Timor	IIID2 IIID2
Arkus Atlantic	2015	09	Container	2001/3/31	Dili, East Timor	IIID2	Dill, East Timor	IIID2 IIID2
Arktis Atlantic	2815	89	Container	2001/4/7	Dill, East Timor	IIIB2	Dill, East Timor	IIIBZ
Arktis Atlantic	2815	89	Container	2001/4/14	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/4/14	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/4/21	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/4/28	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/5/5	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/5/12	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/5/19	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/5/26	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/6/2	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/6/10	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Arktis Atlantic	2815	89	Container	2001/6/16	Dili East Timor	IIIB2	Dili East Timor	IIIB2
Arktic Atlantic	2015	80	Container	2001/0/10	Dili, East Timor	IIID2 IIID2	Dili East Timon	IIID2 IIID2
Anklis Atlantic	2015	09	Container	2001/0/23	Dili, East Timor	IIID2	Dill, East Timor	IIID2 IIID2
	2015	09	Container	2001/0/30	Dill, East Timor	HIDA	Dill, East Timor	HID2
AIKUS AUAIIUC	2010	09	Detrol	2001/0/3U	Dill, East Timor		Dill, East 11mor	11102
Arnnem Bay	240	38	ratrol	2001/3/21	Dill, East Timor	IIIBZ	Dill, East 11mor	IIIB2
Aya 3	2563	80	General	2000/7/6	Dill, East Timor	IIIBZ	Dill, East Timor	IIIB2
Aya 3	2563	86	General	2000/7/14	Dill, East Timor	111B2	Din, East Timor	111B2
Aya 3	2563	86	General	2000/7/22	Dili, East Timor	111B2	Surabaya, Indonesia	Lombok-Jawa
Baltimar Euros	1329	91	Container	2000/7/6	Dili, East Timor	IIIB2	Townsville, Australia	
Bremen	6752	112	Cruise	2000/12/5	Larantuka,	IIIB2	Thursday Island,	
Britoil 29	342	32	Tug	2001/1/4	Dili, East Timor	IIIB2	Singapore	Lombok-Karimata
Britoil 29	342	32	Tug	2001/1/9	Dili, East Timor	IIIB2	Singapore	Lombok-Karimata
Calma 11	1.40	0.0	Deserved as at	0001/4/11	Kupang, Timor,	IIIDo	Kupang, Timor,	Indian Origin
Cakra II	140	23	Prawning	2001/4/11	Indonesia	IIIBz	Indonesia	Indian Ocean
a					Kupang, Timor,		Kupang, Timor,	.
Cakra 11	140	23	Prawning	2001/4/12	Indonesia	IIIB2	Indonesia	Indian Ocean
					Kunang Timor		Kupang Timor	
Cakra 11	140	23	Prawning	2001/4/13	Indonesia	IIIB2	Indonesia	Indian Ocean
Carabao I	1497	70	- Livoctock	2000/9/12	Dili Fost Time	TIIDo	Monilo Dhilinni	IIIB2_IIIA_IIIE1
Caravav I Cas Dasifia	140/	20	Compan-1	2000/0/13	Dili East Timor	HID2 HID9	Dili East Tire	IIIDe-IIIA-IIIEI
	2017	03	General	2000/12/25	Dili, East Timor	11102	Dill, East Timor	111D2 111D9
Cec Pacific	2015	69 80	General	2000/12/27	Dill, East Timor	IIIBZ	Dill, East 11mor	111B2
Cec Pacific	2815	89	General	2001/1/14	Dill, East Timor	111B2	Dill, East Timor	111B2
Cec Pacific	2815	89	General	2001/1/20	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Cec Pacific	2815	89	General	2001/1/28	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Cec Pacific	2815	89	General	2001/2/14	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Cec Pacific	2815	89	General	2001/3/3	Dili, East Timor	IIIB2	Singapore	Lombok-Karimata
Cec Pacific	2815	89	General	2001/3/19	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Cec Pacific	2815	89	General	2001/4/5	Dili, East Timor	IIIB2	Singapore	Lombok-Karimata
Cec Pacific	2815	89	General	2001/4/21	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Cec Pacific	2815	89	General	2001/5/8	Dili, East Timor	IIIB2	Singapore	Lombok-Karimata
Cec Pacific	2815	89	General	2001/5/23	Dili East Timor	IIIB2	Singapore	Lombok-Karimata
Cec Pacific	2815	89	General	2001/6/9	Dili East Timor	JIIB2	Dili East Timor	JIIB2

Voccol	CPT	LOA	Shin's Type	Arrival Data	Last Port	Pouto1	Novt Port	Pouto?
ConDentifie	0017		Convert	Annvar Date		HUDO	Ct	T LL K
Cec Pacific	2815	89	General	2001/6/28	Dill, East Timor	IIIBZ	Singapore	Lombok-Karimata
Comoro River	4410	100	Container	2001/2/10	Dili, East Timor	IIIB2	Townsville, Australia	
Comoro River	4410	100	Container	2001/6/26	Dili, East Timor	IIIB2	Dili. East Timor	IIIB2
Coral Trador	1887	100	Po/Po	2000/11/4	Dili East Timor	IIIB2	Dili East Timor	IIIB2
	4007	100	K0/K0	2000/11/4	DIII, East Thillor	111D£	Dill, East Tillion	IIID£
Coral Trader	4887	100	Ro/Ro	2001/1/24	Dili Fast Timor	IIIB2	Port Moresby, Papua	
cortar frauer	1007	100	100/100	2001/1/21	Din, East Thior	mba	New Guinea	
Coral Trader	4887	100	Ro/Ro	2001/3/16	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Coral Trador	1887	100	Po/Po	2001/5/8	Dili East Timor	IIIB9	Townsvillo Australia	
	4007	100	K0/K0	2001/3/8	DIII, East Thillor	mba	Townsville, Australia	
Dealco	1715	90	Livesteck	2000/10/31	Dili East Timor	IIIB2	Cagayan De Oro,	IIIB2.IIIA.IIIF1
Dealeo	1/15	50	LIVESTOCK	2000/10/31	Dill, East Thior	mba	Mindanao, Philippines	
			_		Kupang, Timor,		Kupang, Timor,	
Evia Pearl	209	24	Prawning	2001/3/13	Indonesio	IIIB2	Indonesio	IIIB2
			-		muonesia		Indonesia	
FNS La Glorieuse	477	55	Navy	2000/10/13	Dili Fast Timor	IIIB2	Port Moresby, Papua	
i no La civileuse		00	itaty	2000/10/10	Din, East Thior	mba	New Guinea	
					Kupang, Timor,		Kupang, Timor,	
Fukui Maru	147	36	Foreign Fi	2001/1/2	Indonesio	IIIB2	Indonesio	IIIB2
			-		Indonesia		Indonesia	
Fukui Moru	147	26	Foreign Fi	2001/2/12	Kupang, Timor,	IIIB9	Kupang, Timor,	IIIB9
l'ukui Maru	147	30	roreign ri	2001/2/15	Indonesia	mbs	Indonesia	111D2
_					Kupang Timor		Kunang Timor	
Fukui Maru	147	36	Foreign Fi	2001/5/7	Indonesio	IIIB2	Indonesio	IIIB2
	_	-			Indonesia		Indonesia	
Fukui Maru	147	36	Foroign Fi	2001/6/11	Kupang, Timor,	IIIB9	Kupang, Timor,	IIIB9
l'ukui Maru	147	30	roreign ri	2001/0/11	Indonesia	mbt	Indonesia	111D2
Hmas Jervis Bay	7005	88	Navy	2000/7/15	Dili Fast Timor	IIIB2	Dili Fast Timor	IIIB2
II.III.a.s. Scivis Day	7005	00	T VOLV Y	2000/7/15		HIDA		IIIDa
H.m.a.s. Jervis Bay	7005	88	INAVY	2000/7/21	Dill, East Timor	IIIBz	Dill, East Timor	IIIBz
H.m.a.s. Jervis Bay	7005	88	Navy	2000/7/28	<u>Dili, Ea</u> st Timor	IIIB2	<u>Dili, East</u> Timor	IIIB2
Hmas Jervis Rav	7005	88	Navy	2000/8/4	Dili Fast Timor	IIIB9	Dili Fast Timor	IIIB9
II m a a Louid D	7007	00	Norr	2000/0/0/2		TIDA	Dili Erst T	TIDE
n.m.a.s. Jervis Bay	7005	88	inavy	2000/8/8	Dill, East Timor	111B2	Dill, East Timor	111B2
H.m.a.s. Jervis Bav	7005	88	Navv	2000/8/11	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Hmas Ionvic Pov	7005	88	Navy	2000/8/16	Dili Fast Timor	IIIR9	Dili Fast Timor	IIIR9
11.111.a.s. Jervis Bay	1000	00	inavy	LUUU/0/10	DIII, LAST LIINOF	111111111111111111111111111111111111111	DIII, Edst TIIIIOF	11102
H.m.a.s. Jervis Bay	7005	88	Navy	2000/8/18	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H.m.a.s. Jervis Bay	7005	88	Navy	2000/8/20	Dili, East Timor	IIIB2	Dili. East Timor	IIIB2
II m a a Jamit - D	7007	00	Norr	2000/0/0	Dili East T	IIIDa	Dili Et Th	IIIDo
п.m.a.s. Jervis Bay	7005	õõ	INAVÝ	∠UUU/9/6	Dill, East Timor	111111111111111111111111111111111111111	Dill, East Timor	111111111111111111111111111111111111111
H.m.a.s. Jervis Bay	7005	88	Navy	2000/9/8	Dili. East Timor	IIIB2	Dili. East Timor	IIIB2
Hmas Jervis Bay	7005	88	Navy	2000/9/11	Dili East Timor	IIIB2	Dili Fast Timor	IIIB2
II.m.a.s. Servis Day	7005	00	1 4 4 4 9	2000/3/11	Dill, East Tillion	THDS	Dill, East Tillion	TIDS
H.m.a.s. Jervis Bay	7005	88	Navy	2000/9/15	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H.m.a.s. Jervis Bav	7005	88	Navy	2000/9/29	Dili, East Timor	IIIB2	Dili. East Timor	IIIB2
II m o c. Jamic Boy	7005	00	Nerry	2000/10/6	Dili East Timer	IIID9	Dili East Timer	IIID9
H.III.a.s. Jervis bay	7005	00	INAVY	2000/10/0	Dill, East Tillior	IIID2	Dill, East Tillior	IIIBL
H.m.a.s. Jervis Bay	7005	88	Navy	2000/10/11	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H m a s Jervis Bav	7005	88	Navy	2000/10/15	Dili East Timor	IIIB2	Dili East Timor	IIIB2
II.m.a.s. Jerris Day	7005	00	Narra	2000/10/10	Dill, Edst Timor	IIIDo	Dill, East Timor	IIIDo
H.m.a.s. Jervis Bay	7005	88	INAVY	2000/10/19	Dill, East Timor	IIIBz	Dill, East Timor	IIIBz
H.m.a.s. Jervis Bay	7005	88	Navy	2000/10/23	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H m a s Jervis Bay	7005	88	Navy	2000/10/27	Dili East Timor	IIIB2	Dili Fast Timor	IIIB2
II m a a Jamia Bay	7005	00	Norr	2000/10/20	Dill East Timer	TIID9	Dili East Timor	TITD9
n.iii.a.s. Jervis day	7005	00	INAVY	2000/10/30	Dill, East Timor	IIIDź	Dill, East Timor	IIIDź
H.m.a.s. Jervis Bay	7005	88	Navy	2000/11/10	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H m a s Jervis Bav	7005	88	Navy	2000/11/17	Dili East Timor	IIIB2	Dili East Timor	IIIB2
II m a a Jamia Bay	7005	00	Norr	2000/11/24	Dili East Timer	TITD 9	Dili East Timor	TITD9
H.III.a.s. Jervis bay	7005	00	INAVY	2000/11/24	Dill, East Tillior	IIID2	Dill, East Tillior	IIIBL
H.m.a.s. Jervis Bay	7005	88	Navy	2000/12/1	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H m a s Jervis Bav	7005	88	Navy	2000/12/15	Dili Fast Timor	IIIB2	Dili Fast Timor	IIIB2
II m a a Jamia Bay	7005	00	Norr	2000/12/22	Dill East Timer	TIID9	Dili East Timor	TITD9
n.m.a.s. Jervis Day	7005	00	INAVy	2000/12/22	Dill, East Timor	IIIDź	Dill, East Timor	IIID2
H.m.a.s. Jervis Bay	7005	88	Navy	2001/1/5	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H.m.a.s. Jervis Bay	7005	88	Navy	2001/1/12	Dili East Timor	IIIB2	Dili East Timor	IIIB2
II m o c. Iomric Dov	7005	00	Norm	2001/1/10	Dili East Timer	IIID9	Dili East Timer	IIID9
H.III.a.s. Jervis bay	7005	00	INAVY	2001/1/19	Dill, East Tillior	IIID2	Dill, East Tillior	IIIBL
H.m.a.s. Jervis Bay	7005	88	Navy	2001/1/26	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H m a s Jervis Bav	7005	88	Navy	2001/2/2	Dili East Timor	IIIB2	Dili East Timor	IIIB2
II m o o Jomio Day	7005	00	Norr	2001/2/2	Dili East Timer	TIID9	Dili East Timor	TITD9
11.111.a.s. Jervis Bay	7000	00	inavy	2001/2/9	DIII, EaSt TIMOF	111DZ	Diff, East Tilliof	11102
H.m.a.s. Jervis Bay	7005	88	Navy	2001/2/16	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
H.m.a.s. Jervis Bav	7005	88	Navv	2001/2/20	Dili, East Timor	IIIB2	Dili. East Timor	IIIB2
Hmas Ionvie Bay	7005	88	Navy	2001/2/23	Dili Fact Timor	IIIB9	Dili Fast Timor	IIIR9
TT T T T T T T T T T T T T T T T T T T	7003	00	1 NAVY	2001/2/23	DIII, Last TIMOF	111111111111111111111111111111111111111		111102
п.m.a.s. Jervis Bay	7005	88	inavy	2001/3/2	Dilli, East Timor	IIIB2	Dill, East Timor	111B2
H.m.a.s. Jervis Bav	7005	88	Navv	2001/3/5	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Hmas Iorvie Boy	7005	88	Navy	2001/2/0	Dili Fast Timor	IIIB9	Dili Fast Timor	IIIB9
II and a start is Day	7007	00	NI	2001/0/10		TIDA	Dili E	TIDE
n.m.a.s. Jervis Bay	7005	60	inavy	2001/3/16	Dill, East Timor	IIIBZ	Dill, East Timor	IIIBZ
H.m.a.s. Jervis Bay	7005	88	Navy	2001/3/21	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Hmas Jervis Rav	7005	88	Navy	2001/3/23	Dili Fast Timor	IIIB9	Dili Fast Timor	IIIB9
II m o a Land D	7007	00	Norr	2001/0/20		TIDA		IIIDe
п.m.a.s. Jervis Bay	7005	ðð	inavý	2001/3/30	Dill, East Timor	111B2	Dill, East Timor	111B2
H.m.a.s. Jervis Bay	7005	88	Navy	2001/4/6	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
Hmas Jervie Rav	7005	88	Navy	2001/4/17	Dili Fast Timor	IIIB9	Dili Fast Timor	IIIB2
II I I I	7007	00		2001/1/11		HIDA		IIIDa
H.m.a.s. Jervis Bay	/005	88	INavy	2001/4/21	Dill, East Timor	111B2	Dill, East Timor	111B2
H.m.a.s. Jervis Bav	7005	88	Navy	2001/4/25	Dili, East Timor	IIIB2	Hobart, Ts, Australia	
H m a s Huon	720	53	Navy	2000/10/20	Dili Fast Timor	IIIR9	Dili Fast Timor	IIIR9
	160	110	a vavy	2000/10/23		11106		11106
KINS BIrobong	4200	112	INAVY	2001/3/21	Dill, East Timor	111B2	Dill, East Timor	111B2
KNS Hyangrobong	4200	112	Navy	2000/10/4	Dili, East Timor	IIIB2	Korea, South	IIIB2-IIIA-IIIA1
							Port Moreshy Papua	
Markham River	5220	116	Container	2001/4/11	Dili, East Timor	IIIB2	Nor Costo o	
	L	L					inew Guinea	
Namin D 1	100	0.4	Duran 1	9001/4/1	Kupang, Timor.	THE	Kupang, Timor,	HIDE
Napier Pearl	160	24	Prawning	2001/4/1	Indonosio	IIIB2	Indonesia	111B2
	107-				nuonesia	***	muonesia	
Norvantes	1259	76	Livestock	2001/5/13	Dili, East Timor	IIIB2	<u> </u>	
Norvantes	1259	76	Livestock	2001/6/19	Dili East Timor	IIIB2		
	15001	157	LIVESTOCK	2000/0/13		11156	D 1 A 1	
Uivia	15791	157	Cruise	2000/9/12	Dill, East Timor	111B2	Brisbane, Australia	
	000	00	E: 1 ·	0000/11/11/2	Kupang, Timor.	TUDC	Kupang, Timor,	HIDE
Urion	300	33	Fishing	2000/11/10	Indonesia	111B2	Indonesia	111B2
			-		Traduliesia		muonesia	
Orion	300	22	Fishing	2001/1/6	Kupang, Timor,	IIIB9	Darwin Australia	
011011	300	33	risning	2001/1/0	Indonesia	IIIDZ	Darwin, Australia	
					Kunong Timon		<u> </u>	
Orion	300	33	Fishing	2001/1/6		IIIB2	Darwin, Australia	
			В		Indonesia	~~	, - 	
Seram Pearl	183	25	Fishing	2000/11/3	Dili East Timor	IIJB2	Jakarta Indonesia	Lombok-Jawa
Sorum i cari	100	~0	- ioning	~000/11/0	Vunong Tim		Vunana Timonesia	ound
Seram Pearl	183	25	Fishing	2001/1/16	Kupang, 1 imor,	IIIB2	Kupang, 11mor,	IIIB2
Saunican	100	~0	. 1511115	~001/1/10	Indonesia		Indonesia	

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Temburong	2614	90	Livestock	2000/7/19	Dili, East Timor	IIIB2	Brunei, Brunei	Lombok-Karimata
Temburong	2614	90	Livestock	2000/8/7	Dili Fast Timor	IIIB2	Darussalam Brunei Darussalam	Lombok-Karimata
Temburong	2614	90	Livestock	2000/8/15	Dili, East Timor	IIIB2	Broome Australia	Lombolt Hurmidia
Temburong	2614	90	Livestock	2000/12/1	Dili, East Timor	IIIB2	Brunei Darussalam	Lombok-Karimata
USS Curtis Wilbur	8400	154	Navy	2001/2/26	Dili, East Timor	IIIB2	Okinawa, Okinawa,	IIIB2-IIIA-IIIA1
USS O'Brien	3680	172	Navy	2000/10/23	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
USS O'Brien	3680	172	Navy	2000/11/1	Dili, East Timor	IIIB2	Dili, East Timor	IIIB2
USS Paul F Foster	8040	172	Navy	2001/5/24	Dili, East Timor	IIIB2	Mackay, Australia	
USS Stethem	9033	154	Navy	2001/5/24	Dili, East Timor	IIIB2	Cairns, Australia	
Capricorn Ace	17162	130	Car/Carry	2000/7/23	Nagoya, Japan	IIIB2-IIIA-IIIA1	Fremantle (Kwinana), Australia	
Parkgracht USS O'Brien	5998 3680	114	General	2000/10/29	Kobe, Japan Japan	IIIB2-IIIA-IIIA1 IIIB2-IIIA-IIIA1	Dampier, WA, Australia	IIIB2-IIIA-IIIA1
Adele	2471	89	Livestock	2000/10/23	Manila Philippines	IIIB2-IIIA-IIIE1	Manila Philippines	IIIB2-IIIA-IIIE1
Amelia	2629	78	Livestock	2000/7/6	Manila, Philippines	IIIB2-IIIA-IIIE1	Jakarta. Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/8/1	Batangas, Luzon, Philippines	IIIB2-IIIA-IIIE1	Batangas, Luzon, Philippines	IIIB2-IIIA-IIIE1
Amelia	2629	78	Livestock	2000/8/16	Batangas, Luzon, Philippines	IIIB2-IIIA-IIIE1	Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/12/7	Batangas, Luzon,	IIIB2-IIIA-IIIE1	Panjang, Indonesia	
					General			
Amelia	2629	78	Livestock	2001/1/12	Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1	Jakarta, Indonesia	Lombok-Jawa
Apollogracht	7949	130	General	2001/4/8	Kobe, Japan	IIIB2-IIIA-IIIE1	Dampier, WA, Australia	
Bison Express	4848	120	Livestock	2000/7/6	Cagayan De Oro, Mindanao,	IIIB2-IIIA-IIIE1	Adabiya, Egypt	Indian Ocean
Camira	3246	86	Livestock	2000/10/19	Manila, Philippines	IIIB2-IIIA-IIIE1	Batangas, Luzon,	IIIB2-IIIA-IIIE1
Camira	3946	86	Livesteel	2001/6/99	Philipping		Philippines Jakarta Indonasia	Lombok Jawa
Camira	3246	86	LIVESTOCK	2001/6/28	Philippines	IIIB2-IIIA-IIIEI	Jakarta, Indonésia	Lombok-Jawa
Dealco	4745	90	Livestock	2000/9/13	Datangas, Luzon, Philippines	IIIB2-IIIA-IIIE1	Cagayan De Oro, Mindanao Philippines	IIIB2-IIIA-IIIE1
					Cagavan De Oro.		Minuanao, 1 mippines	
Dealco	4745	90	Livestock	2000/11/13	Mindanao, Philippines	IIIB2-IIIA-IIIE1	Jakarta, Indonesia	Lombok-Jawa
D 1				0000/10/10	Cagayan De Oro,			
Dealco	4745	90	Livestock	2000/12/10	Mindanao, Philippinos	111B2-111A-111E1	Jakarta, Indonesia	Lombok-Jawa
					Cagayan De Oro			
Dealco	4745	90	Livestock	2001/1/20	Mindanao, Philippines	IIIB2-IIIA-IIIE1	Indonesia	
Dealco	4745	90	Livestock	2001/6/25	Philippines	IIIB2-IIIA-IIIE1	Bintulu, Sarawak,	Lombok-Karimata
Dealco Handy Emerald	4745	90	Livestock	2001/6/25	Philippines	IIIB2-IIIA-IIIE1	Bintulu, Sarawak, Malaysia Taumauilla, Austrolia	Lombok-Karimata
Dealco Handy Emerald	4745 16582	90 166	Livestock D/Bulk	2001/6/25 2001/6/5	Philippines Cebu, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, Malaysia Townsville, Australia	Lombok-Karimata
Dealco Handy Emerald Jackaroo	4745 16582 6159	90 166 118	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29	Philippines Cebu, Philippines General Santos/dadiangas,	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, Malaysia Townsville, Australia General Santos/dadiangas,	Lombok-Karimata IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo	4745 16582 6159	90 166 118	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo	4745 16582 6159 6159	90 166 118 118	Livestock D/Bulk Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas,	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, Malaysia Townsville, Australia General Santos/dadiangas, Philippines Adabiya, Egypt	Lombok-Karimata IIIIB2-IIIA-IIIE1 Indian Ocean
Dealco Handy Emerald Jackaroo Jackaroo	4745 16582 6159 6159	90 166 118 118	Livestock D/Bulk Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	1111B2-111A-111E1 1111B2-111A-111E1 1111B2-111A-111E1 1111B2-111A-111E1	Bintulu, Sarawak, Malaysia Townsville, Australia General Santos/dadiangas, Philippines Adabiya, Egypt	Lombok-Karimata IIIIB2-IIIA-IIIE1 Indian Ocean
Dealco Handy Emerald Jackaroo Jackaroo	4745 16582 6159 6159	90 166 118 118	Livestock D/Bulk Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express	4745 16582 6159 6159 5959	90 166 118 118 118	Livestock D/Bulk Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas,	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express	4745 16582 6159 6159 5959	90 166 118 118 118	Livestock D/Bulk Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, Malaysia Townsville, Australia General Santos/dadiangas, Philippines Adabiya, Egypt Panjang, Indonesia	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express	 4745 16582 6159 6159 5959 5959 	90 166 118 118 118	Livestock D/Bulk Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express	4745 16582 6159 6159 5959 5959	90 166 118 118 118 118 118	Livestock D/Bulk Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas,	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express	4745 16582 6159 6159 5959 5959	90 166 118 118 118 118 118	Livestock D/Bulk Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express	 4745 16582 6159 6159 5959 5959 2762 	90 166 118 118 118 118 118	Livestock D/Bulk Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E	 4745 16582 6159 6159 5959 5959 2762 	90 166 118 118 118 118 118 92	Livestock D/Bulk Livestock Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia <u>General</u> Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E	4745 16582 6159 6159 5959 5959 2762	90 166 118 118 118 118 118 92	Livestock D/Bulk Livestock Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E	4745 16582 6159 6159 5959 5959 2762 2762	90 166 118 118 118 118 92 92	Livestock D/Bulk Livestock Livestock Livestock Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas,	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Santos/dadiangas</u> ,	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E	4745 16582 6159 6159 5959 2762 2762	90 166 118 118 118 118 92 92	Livestock D/Bulk Livestock Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E	4745 16582 6159 6159 5959 2762 2762	90 166 118 118 118 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762	90 166 118 118 118 92 92 92 92	Livestock D/Bulk Livestock Livestock Livestock Livestock Livestock Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines Manila, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Santos/dadiangas</u> ,	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762	90 166 118 118 118 118 92 92 92 92	Livestock D/Bulk Livestock Livestock Livestock Livestock Livestock Livestock Livestock Livestock Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines Manila, Philippines General	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, Philippines Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Comparent Santos/dadiangas, Comparent Santos/dadiangas,	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762	90 166 118 118 118 92 92 92 92 92 92 92 92 92 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27 2000/8/23	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines Manila, Philippines General Santos/dadiangas,	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Santos/dadiangas,</u> <u>General</u> Santos/dadiangas, <u>Santos/dadiangas,</u> <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas,	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762	90 166 118 118 118 118 92 92 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27 2000/9/23	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, Philippines Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, General Santos/dadiangas, General Santos/dadiangas, General Santos/dadiangas, General Santos/dadiangas, Santos/dadiangas, Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762	90 166 118 118 118 118 92 92 92 92 92 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/8/29 2000/7/19 2000/8/1 2000/8/27 2000/8/27	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Santos/dadiangas</u> , <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> <u>General</u> <u>Santos/Jadiangas</u> , <u>General</u> <u>Santos/Jadiangas</u> , <u>General</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 92 92 92 92 92 92 92 92 92 92 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>Santos/dadiangas</u> , <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>General</u> Santos/dadiangas, <u>Santos/dadiangas</u> , <u>Santos/dadiangas</u> , <u>S</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 92 92 92 92 92 92 92 92 92 92 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27 2000/9/23 2000/12/14	Philippines Cebu, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Santos/dadiangas,</u> <u>Santos/dadiangas,</u> <u>Santos/dadiangas,</u> <u>Santos/dadiangas,</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> Santos/dadiangas, <u>Philippines</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>Santos/dadiangas,</u> <u>Philippines</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 93 94 95 96 97 98 99 92 93 94 95 96	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Santos/dadiangas, Philippines General Santos/dadiangas, San	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> <u>General</u> Santos/dadiangas, <u>Philippines</u> <u>General</u> Santos/Badiangas, <u>Philippines</u> <u>Batos/Batos</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Constructure</u> <u>Cons</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27 2000/8/27 2000/9/23 2000/12/14 2000/12/26	Philippines Cebu, Philippines General Santos/dadiangas, Philippines Ge	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 92 92 92 92 92 92 92 92 92 92 92 92 92 92 92 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Canaral	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Lis E Lis E Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 93 94 95 96 97 98 99 94	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Lis E Lis E Lis E Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/5 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26 2001/3/1	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 93 94 95 95	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/14	Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines General Santos/dadiangas, Philippines	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/27 2000/8/27 2000/9/23 2000/12/14 2000/12/14 2000/12/15	Philippines Cebu, Philippines General Santos/dadiangas, Philippines Manila, Philippines General Santos/dadiangas, Philippines Santos/dadiangas	IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General General Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Kanumba Australia	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Lis E Lis E Lis E Lis E Lis E Lis E Lis E Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762	90 166 118 118 118 118 92 92 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26 2001/3/1 20001/3/15	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> <u>General</u> Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia <u>General</u> Santos/dadiangas, <u>Philippines</u> <u>General</u> Santos/dadiangas, <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>General</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>Ceneral</u> <u>Santos/dadiangas,</u> <u>Philippines</u> <u>Karumba, Australia</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E	4745 16582 6159 6159 5959 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762 2762 1370	90 166 118 118 118 118 92 93 94 95 96 97 98 99 91 92	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26 2001/3/1 2001/3/15 2001/2/25	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Karumba, Australia Jakarta, Indonesia	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E	 4745 16582 6159 6159 5959 2762 1370 	90 166 118 118 118 118 92 93 94 95 96 97 98 99 91 92 93 <tr< td=""><td>Livestock D/Bulk Livestock Livestock</td><td>2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26 2001/3/1 2001/3/15 2001/2/25</td><td>Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang</td><td>IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1</td><td>Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Karumba, Australia Jakarta, Indonesia Corougn Do Oro</td><td>Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1</td></tr<>	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/26 2001/3/1 2001/3/15 2001/2/25	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> Townsville, Australia General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Karumba, Australia Jakarta, Indonesia Corougn Do Oro	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Nolunat Norvantes	 4745 16582 6159 6159 5959 2762 1370 1259 	90 166 118 118 118 118 92 93 94 95 96 76	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/14 2000/12/26 2001/3/15 2001/2/25 2000/7/4	Philippines Cebu, Philippines Cebu, Philippines General Santos/dadiangas, Philippines General Santos/dadiang	IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Santos/dadiangas, <u>Philippines</u> Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Karumba, Australia <u>Jakarta, Indonesia</u> Cagayan De Oro, <u>Mindonae</u> <u>Philippines</u>	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1
Dealco Handy Emerald Jackaroo Jackaroo Kerry Express Kerry Express Lis E Norvantes	 4745 16582 6159 6159 5959 2762 1370 1259 	90 166 118 118 118 118 92 93 94 95 96 76	Livestock D/Bulk Livestock	2001/6/25 2001/6/25 2000/12/29 2001/2/5 2000/8/29 2000/11/17 2000/7/19 2000/8/1 2000/8/1 2000/8/27 2000/9/23 2000/12/14 2000/12/14 2000/12/26 2001/3/15 2001/3/15 2001/2/25 2000/7/4	Philippines Cebu, Philippines General Santos/dadiangas, Philippines Manila, Philippines	IIIB2-IIIA-IIIE1	Bintulu, Sarawak, <u>Malaysia</u> <u>Townsville, Australia</u> General Adabiya, Egypt Panjang, Indonesia General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> General Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Santos/dadiangas, <u>Philippines</u> Karumba, Australia <u>Jakarta, Indonesia</u> Cagayan De Oro, Mindanao, Philippines	Lombok-Karimata IIIB2-IIIA-IIIE1 Indian Ocean IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1 IIIB2-IIIA-IIIE1

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Norvantes	1259	76	Livestock	2000/9/16	Batangas, Luzon, Philippines	IIIB2-IIIA-IIIE1	Panjang, Indonesia	
Norvantes	1259	76	Livestock	2000/11/8	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1	Jakarta, Indonesia	Lombok-Jawa
Norvantes	1259	76	Livestock	2000/12/8	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1	Panjang, Indonesia	
Norvantes	1259	76	Livestock	2001/1/22	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1
Norvantes	1259	76	Livestock	2001/2/24	Cebu, Philippines	IIIB2-IIIA-IIIE1	Panjang, Indonesia	
Norvantes	1259	76	Livestock	2001/4/8	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1
Arktis Sirius	1599	80	Container	2000/11/16	China	IIIB2-IIIA-IIIE2	China	IIIB2-IIIA-IIIE2
Global Express 11	3516	100	L/Bulk	2000/7/7	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Global Express 11	3516	100	L/Bulk	2000/9/5	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Global Express 11	2516	100	L/Bulk	2000/11/16	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Global Express 11	3510	100	L/BUIK	2001/2/15	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Global Express 11	3510	100	L/Bulk	2001/5/9	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Global Express 11	2206	100	L/DUIK	2000/8/5	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Coldon Crux No.15	3300	100	L/Bulk	2000/8/3	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Colden Crux No.15	3300	100	L/Bulk	2000/10/13	Santan, Indonesia	IIIB2-Makasar	Santan, Indonesia	IIIB2-Makasar
Golden Crux No.15	3306	100	L/Bulk	2001/4/11	Santan, Indonesia	IIIB2-Makasar	Thailand	Lombok-Karimata
Al Nilam	4800	103	Livestock	2001/6/26	Adahiya Foynt	Indian Ocean	Adahiya Foynt	Indian Ocean
Alligator River	4953	116	Container	2000/7/18	Dili East Timor	Indian Ocean	Townsville Australia	
Arktis Sirius	1599	80	Container	2001/6/29	Cilacap, Indonesia	Indian Ocean	Cilacap, Indonesia	Indian Ocean
Bison Express	4848	120	Livestock	2000/10/3	Jeddah, Saudi	Indian Ocean	Jakarta, Indonesia	Lombok-Jawa
Buffalo Express	2374	82	Livestock	2000/10/16	Cilacap, Indonesia	Indian Ocean	Klang, Malaysia	
Comina	0040	00	I. da	9001/9/90	Cileren Indenesia	Indian Ossan	Brunei, Brunei	Lendel Malazza
Dealco	3246	80 90	Livestock	2001/2/26	Cilacap, Indonesia	Indian Ocean	Darussalam Jakarta Indonesia	Lombok-Makasar
Farid F	6671	141	Livestock	2000/7/21	Colombo, Sri Lanka	Indian Ocean	General	IIIB2-IIIA-IIIE1
Jaalaanaa	6150	110	Livesteel	2000/8/2	Adobino Egymt	Indian Ocean	Santos/dadiangas,	Indian Ocean
Jackaroo	6159	118	Livestock	2000/8/3	Adabiya, Egypt	Indian Ocean	Adabiya, Egypt	Indian Ocean
Jackaroo	60120	264	Cruico	2001/4/3	Adabiya, Egypt	Indian Ocean	Adabiya, Egypt	inuian Otean
Vasa Neslihan	25938	186	Sulphur	2001/5/10	Jubail Saudi Arabia	Indian Ocean	Banjarmasin Indonesia	
Zebu Express	2513	82	Livestock	2000/12/17	Cilacan Indonesia	Indian Ocean	Cilacan Indonesia	Indian Ocean
Adele	2471	89	Livestock	2000/8/22	Jakarta, Indonesia	Lombok-Jawa	Paniang, Indonesia	
Amelia	2629	78	Livestock	2000/7/19	Jakarta, Indonesia	Lombok-Jawa	Batangas, Luzon,	IIIB2-IIIA-IIIE1
Amolia	2620	78	Livostock	2000/8/28	Jakarta Indonesia	Lombok-Jawa	Thinppines Jakarta Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/9/15	Jakarta Indonesia	Lombok-Jawa	Jakarta Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/10/16	Jakarta, Indonesia	Lombok-Jawa	Jakarta Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/10/27	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/11/8	Jakarta. Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2001/1/3	Jakarta, Indonesia	Lombok-Jawa	General Santos/dadiangas,	IIIB2-IIIA-IIIE1
Amelia	2629	78	Livestock	2001/1/24	Jakarta, Indonesia	Lombok-Jawa	Panjang, Indonesia	
Amelia	2629	78	Livestock	2001/2/21	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2001/3/5	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2001/3/18	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2001/4/2	Jakarta, Indonesia	Lombok-Jawa	Panjang, Indonesia	
Amelia	2629	78	Livestock	2001/6/1	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Bader 111	26409	205	Livestock	2001/5/1	Jakarta, Indonesia	Lombok-Jawa	Adabiya, Egypt	Indian Ocean
Baltimar Boreas	2854	92	General	2000/12/20	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Baltimar Boreas	2854	92	General	2001/1/25	Jakarta, Indonesia	Lombok-Jawa	Singapore	Lombok-Karimata
Buffalo Express	2374	82	Livestock	2001/2/9	Jakarta, Indonesia	Lombok-Jawa	Australia	
Buffalo Express	2374	82	Livestock	2001/3/27	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Buffalo Express	2374	82	Livestock	2001/4/19	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Buffalo Express	2374	82	Livestock	2001/6/6	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Buffalo Express	2374	82	Livestock	2001/6/29	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Camira	3246	80	Livestock	2000/7/30	Jakarta, Indonesia	Lombok-Jawa	Panjang, Indonesia	Lambal I
Camira	3246	86	Livestock	2001/3/24	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Camira	3246	86	Livestock	2001/4/8	Jakarta, Indonesia	Lombok-Jawa	Darussalam	Lombok-Makasar
Camira	3246	86	Livestock	2001/4/9	Jakarta, Indonesia	Lombok-Jawa	Brunei, Brunei Darussalam	Lombok-Makasar
Camira	3246	86	Livestock	2001/6/1	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Carabao I	1487	70	Livestock	2000/12/14	Jakarta, Indonesia	Lombok-Jawa	Pasir Gudang, Johor (johor Port), Malaysia	Lombok-Karimata
Carabao I	1487	70	Livestock	2000/12/15	Jakarta, Indonesia	Lombok-Jawa	Pasir Gudang, Johor (johor Port). Malaysia	Lombok-Karimata
Carabao I	1487	70	Livestock	2001/2/5	Jakarta, Indonesia	Lombok-Jawa	Brunei, Brunei Darussalam	Lombok-Karimata
Carabao I	1487	70	Livestock	2001/2/21	Jakarta, Indonesia	Lombok-Jawa	Panjang, Indonesia	1
Carabao I	1487	70	Livestock	2001/6/2	Surabaya, Indonesia	Lombok-Jawa	Karumba, Australia	
Cec Dream	2588	89	General	2001/2/24	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Cec Dream	2588	89	General	2001/3/14	Jakarta, Indonesia	Lombok-Jawa	Singapore	Lombok-Karimata
Chekianø	18391	185	Container	2000/9/10	Jakarta. Indonesia	Lombok-Jawa	Port Moresby, Papua	
Chekiang	18391	185	Container	2001/1/9	Jakarta Indonesia	Lombok-Jawa	New Guinea Port Moresby, Papua	
	10001		Somunici		- mar ca, maoneoid	on ound	New Guinea	

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Chenan	18391	185	Container	2000/9/21	Jakarta, Indonesia	Lombok-Jawa	Port Moresby, Papua	
Chenan	18391	185	Container	2001/1/22	Jakarta Indonesia	Lombok-Jawa	New Guinea Townsville Australia	
Chengtu	18391	185	Container	2000/10/6	Jakarta, Indonesia	Lombok-Jawa	Port Moresby, Papua	
Dealco	4745	90	Livestock	2000/11/26	Jakarta, Indonesia	Lombok-Jawa	New Guinea Cagayan De Oro, Mindanao Philippines	IIIB2-IIIA-IIIE1
Dealco	4745	90	Livestock	2000/12/23	Jakarta, Indonesia	Lombok-Jawa	Townsville, Australia	
Dealco	4745	90	Livestock	2001/2/14	Surabaya, Indonesia	Lombok-Jawa	Surabaya, Indonesia	Lombok-Jawa
Dealco	4745	90	Livestock	2001/2/25	Surabaya, Indonesia	Lombok-Jawa	Philippines	IIIB2-IIIA-IIIE1
Dealco	4745	90	Livestock	2001/3/14	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Dealco	4745	90	Livestock	2001/3/25	Surabaya, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Dealco	4745	90	Livestock	2001/4/23	Jakarta, Indonesia	Lombok-Jawa	Cilacap, Indonesia	Indian Ocean
Dealco	4745	90 70	Livestock	2001/5/23	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Estancia	2199	72	Livestock	2000/7/18	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Friesian Express	5218	109	Livestock	2000/7/3	Jakarta, Indonesia	Lombok-Jawa	General Santos/dadiangas,	IIIB2-IIIA-IIIE1
Friesian Express	5218	109	Livestock	2000/7/24	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Friesian Express	5218	109	Livestock	2000/8/3	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Friesian Express	5218	109	Livestock	2000/8/9	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Friesian Express	5218	109	Livestock	2000/9/12	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Friesian Express	5218	109	Livestock	2001/2/17	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok Jawa
Frieslan Express	147	109	Elvestock	2001/3/3	Jakarta, Indonesia	Lombok Jawa	Vunang Timon	LUIIDUK-Jawa
Fukui Maru Jaakaraa	6150	30	Foreign Fi	2001/4/9	Jakarta, Indonesia	Lombok-Jawa	Kupang, 11mor, Dhilinning	
Janat 1	4961	97	Livestock	2001/0/20	Jakarta Indonesia	Lombok-Jawa	Takarta Indonesia	Lombok-Jawa
Janet 1	4961	97	Livestock	2000/8/28	Jakarta Indonesia	Lombok-Jawa	Jakarta Indonesia	Lombok-Jawa
Janet 1	4061	07	Livesteck	2000/0/20	Cilocon Indonesia	Lombok Jawa	General	
	4901	31	LIVESTOCK	2000/9/10	Chacap, Indonesia	LUNDOK-Jawa	Santos/dadiangas,	111D&-111A-111E1
Janet I	4961	97	Livestock	2000/11/29	Jakarta, Indonesia	Lombok-Jawa	XX7	
Levin	4643	97	Livestock	2000/7/19	Surapaya, Indonesia	Lombok-Jawa	wynanam, Australia	Th. J. Y
Levin	4643	97	Livestock	2000/12/29	Surabaya, Indonesia	Lombok-Jawa	Surabaya, Indonesia	Lombok-Jawa
Molunat	1370	69	Livestock	2000/7/16	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Molunat	1370	69	Livestock	2000/12/22	Jakarta, Indonesia	Lombok-Jawa	Panjang, Indonesia	HID9 HIA HIE1
Molumot	1370	60	Livestock	2000/12/22	Jakarta, Indonesia	Lombok-Jawa	Manila, Philippines	Lombok Jowo
Molunat Nonion Deenl	1370	09	Drouming	2001/3/14	Jakarta, Indonesia	Lombok-Jawa	Jakanta Indonesia	Lombok Jawa
Naplei Feati	100	24	Flawing	2000/11/15	Jakaita, muonesia	Lonibok-Jawa	Batangas Luzon	Lombok-Jawa
Norvantes	1259	76	Livestock	2000/10/3	Jakarta, Indonesia	Lombok-Jawa	Philippines	IIIB2-IIIA-IIIE1
Norvantes	1259	76	Livestock	2000/11/23	Jakarta, Indonesia	Lombok-Jawa	Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1
Norwegian Star	28018	206	Cruise	2000/8/19	Jakarta, Indonesia	Lombok-Jawa	Broome, Australia	
Orion	300	33	Fishing	2000/9/17	Jakarta, Indonesia	Lombok-Jawa	Jakarta, Indonesia	Lombok-Jawa
Pollux	5395	116	Livestock	2000/12/16	Jakarta, Indonesia	Lombok-Jawa	Panjang, Indonesia	
Zebu Express	2513	82	Livestock	2000/11/2	Jakarta, Indonesia	Lombok-Jawa	Pasir Gudang, Johor (johor Port), Malaysia	Lombok-Karimata
Acrux	3555	86	Livestock	2000/7/20	Klang, Malaysia	.ombok-Karimat	Klang, Malaysia	Lombok-Karimata
Acrux	3555	86	Livestock	2000/10/4	Klang, Malaysia	.ombok-Karimat	Klang, Malaysia	Lombok-Karimata
Acrux	3555	86	Livestock	2001/3/8	Klang, Malaysia	.ombok-Karimat	Klang, Malaysia	Lombok-Karimata
Adele	2471	89	Livestock	2001/4/4	Pasir Gudang, Johor (johor Port),	.ombok-Karimat	Ho Chi Minh City, Viet Nam	Lombok-Karimata
Adele	2471	89	Livestock	2001/6/23	Pasir Gudang, Johor	.ombok-Karimat	Klang, Malaysia	Lombok-Karimata
Al Nilam	4800	103	Livestock	2000/9/23	Singapore	.ombok-Karimat	Jakarta, Indonesia	Lombok-Jawa
Arktis Sky	1829	80	General	2001/2/20	Singapore	ombok-Karimat	Dampier, WA, Australia	
Buffalo Express	2374	82	Livestock	2000/10/6	Singapore	.ombok-Karimat	Cilacap, Indonesia	Indian Ocean
Buffalo Express	2374	82	Livestock	2000/11/1	Singapore	.ombok-Karimat	Indonesia	
Camira	3246	86	Livesteck	2000/8/31	Kota Kinabalu,	ombok-Karimat	Brunei, Brunei	Lombok-Makasar
Callina .	3240	00	LIVESTOCK	2000/8/31	Malaysia Brunei, Brunei		Darussalam Brunei, Brunei	Lombok Makasar
Camira	3246	86	Livestock	2000/9/17	Darussalam	.ombok-Karimat	Darussalam	Lombok-Makasar
Camira	3246	86	Livestock	2000/10/3	Muara, Brunei Darussalam	.ombok-Karimat	Brunei, Brunei Darussalam	Lombok-Makasar
Carabao I	1487	70	Livestock	2001/1/3	Singapore	.ombok-Karimat	Fremantle (Kwinana), Australia	
Carabao I	1487	70	Livestock	2001/4/16	Singapore	.ombok-Karimat	Panjang, Indonesia	
Changeha	19201	195	Container	2001/5/14	Singaporo	ombok Karimat	Port Moresby, Papua	
Changsha	16591	165	Container	2001/3/14	Singapore	Joinbok-Karinnat	New Guinea	
Clontart	395	32	Tug	2000/10/5	Singapore Pasir Cudang Johor	.ombok-Karimat	Brisbane, Australia	
Codan	1453	69.2	Livestock	2000/10/5	(johor Port),	.ombok-Karimat	Surabaya, Indonesia	
Codan	1453	69.2	Livestock	2001/3/7	Klang, Malaysia	.ombok-Karimat	Jakarta, Indonesia	Lombok-Jawa
Codan	1453	69.2	Livestock	2001/6/19	Pasir Gudang, Johor (johor Port),	.ombok-Karimat	Jakarta, Indonesia	Lombok-Jawa
Diamond A	16725	169	Clinker	2000/7/10	Koh Sichang, Thailand	.ombok-Karimat	Bundaberg, Australia	
Estancia	2199	72	Livestock	2001/3/29	Singapore	.ombok-Karimat	Panjang, Indonesia	
Fulmar	25368	183	Petroleum	2000/7/20	Singapore,	.ombok-Karimat	Cairns, Australia	
Hadra	28277	184	Petroleum	2001/2/28	Singapore	.ombok-Karimat	Dampier, WA, Australia	
Hadra	28277	184	Petroleum	2001/4/30	Singapore	.ombok-Karimat	Dampier, WA, Australia	
Haminea	28277	184	Petroleum	2001/6/20	Singapore	ombok-Karimat	Dampier, WA, Australia	
Hastula	28277	184	Petroleum	2000/8/2	Singapore,	.ombok-Karimat	Dampier, WA, Australia	
Hastula	28277	184	Petroleum	2000/8/23	Singapore,	.ombok-Karimat	Groote Eylandt, Australia	
Hastula	28277	184	Petroleum	2000/9/14	Singapore,	ombok-Karimat	Dampier, WA, Australia	
Haustrum	28277	184	Petroleum	2001/3/30	Singapore	.ombok-Karimat	Dampier, WA, Australia	
Hellas Constellation	27645	183	Petroleum	2001/1/29	Singapore	.ombok-Karimat	r or c moresby, Papua New Guinea	

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Hellas Constellation	27645	183	Petroleum	2001/3/5	Singapore	.ombok-Karimat	Port Moresby, Papua	
	07045	100		2001/0/0	Singapore	112.	New Guinea	
Hellas Progress	27645	183	Comorol	2000/10/18	Singapore	ombok-Karimat	Cairns, Australia	
Lesuzavousk	4600	97	Livestock	2000/8/19	Jakarta Indonesia	ombok-Karimat	Jakarta Indonesia	Lombok-Karimata
Marchekan	28322	183	Petroleum	2001/5/22	Singapore	.ombok-Karimat	Port Moresby, Papua	
Mariner	1655	82	Research	2000/8/18	Singapore	ombok-Karimat	Rigs Australia	
Mariner	1655	82	Research	2000/8/19	Singapore.	.ombok-Karimat	Rigs, Australia	
Pollux	5395	116	Livestock	2001/4/25	Singapore	.ombok-Karimat	Adabiya, Egypt	Indian Ocean
Shorthorn Express	6872	117	Livestock	2001/4/28	Singapore	.ombok-Karimat	Adabiya, Egypt	Indian Ocean
Simunye	28027	174	Petroleum	2000/7/14	Singapore,	.ombok-Karimat	Weipa, Australia	
Simunye	28027	174	Petroleum	2000/12/7	Singapore	.ombok-Karimat	Dampier, WA, Australia	
Simunye	28027	174	Petroleum	2001/1/26	Singapore	.ombok-Karimat	Weipa, Australia	
Simunye	28027	174	Petroleum	2001/5/26	Singapore	.ombok-Karimat	Weipa, Australia	
Tasman	20662	183	Petroleum	2000/12/6	Singapore	.ombok-Karimat	Australia	
Temburong	2614	90	Livestock	2000/11/1	liohor Port),	.ombok-Karimat	Indonesia	
Temburong	2614	90	Livestock	2000/12/18	Brunei Darussalam	.ombok-Karimat	Brunei Darussalam	Lombok-Karimata
Temburong	2614	90	Livestock	2001/1/23	Brunei, Brunei	.ombok-Karimat	Brunei, Brunei	Lombok-Karimata
	-				Darussalam Muana Rmunai		Darussalam Brungi Brungi	
Temburong	2614	90	Livestock	2001/2/9	Darussalam	.ombok-Karimat	Darussalam	Lombok-Karimata
Temburong	2614	90	Livestock	2001/3/20	Pasir Gudang, Johor (johor Port),	.ombok-Karimat	Brunei, Brunei Darussalam	Lombok-Karimata
Temburong	2614	90	Livestock	2001/4/10	Brunei, Brunei Darussalam	.ombok-Karimat	Brisbane, Australia	
Temburong	2614	90	Livestock	2001/6/20	Brunei, Brunei Darussalam	.ombok-Karimat	Jakarta, Indonesia	Lombok-Jawa
Trinidad	28933	185	Petroleum	2000/11/4	Singapore	.ombok-Karimat	Dampier WA Australia	
USS Blue Ridge	18372	194	Navy	2001/4/29	Singapore	ombok-Karimat	Gladstone Australia	
Western Horizon	1581	66	Research	2001/6/21	Singapore	.ombok-Karimat	Darwin, Australia	
Zebu Express	2513	82	Livestock	2000/7/12	Singapore.	.ombok-Karimat	Broome, Australia	
Zebu Express	2513	82	Livestock	2000/11/16	Klang, Malaysia	.ombok-Karimat	Klang, Malaysia	Lombok-Karimata
Zebu Express	2513	82	Livestock	2001/3/10	Singapore	.ombok-Karimat	Jakarta, Indonesia	Lombok-Jawa
Camira	3246	86	Livestock	2001/4/24	Brunei, Brunei Darussalam	Lombok-Makasa	Brunei, Brunei Darussalam	Lombok-Makasar
Camira	3246	86	Livestock	2001/5/12	Brunei, Brunei Darussalam	Lombok-Makasa	Jakarta, Indonesia	Lombok-Jawa
Camira	3246	86	Livestock	2001/6/17	Brunei, Brunei	Lombok-Makasa	General Island/bislig,	IIIB2-IIIA-IIIE1
Aggeon Clory	25877	181	Petroleum	2000/8/29	Darussalam Cairps Australia		Singaporo Singaporo	Lombok-Karimata
Amelia	2629	78	Livestock	2000/10/5	Paniang Indonesia		Jakarta Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/10/3	Panjang, Indonesia		Batangas, Luzon,	IIIB2-IIIA-IIIE1
Amelia	2629	78	Livestock	2000/12/20	Panjang Indonesia		Takarta Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2000/12/20	Panjang, Indonesia		Jakarta, Indonesia	Lombok-Jawa
Amelia	2629	78	Livestock	2001/2/0	Panjang, Indonesia		Jakarta Indonesia	Lombok-Jawa
Arcadia Highway	49012	180	Car/Carry	2000/10/17	Fremantle (Kwinana)		Nagoya, Japan	IIIB2-IIIA-IIIE1
Arktis River	1598	76 26	Container	2000/7/23	(Rwinana),			
Arktis Sirius	1599	80	Container	2000/9/2	Dampier, WA, Australia		Singapore, Singapore	Lombok-Karimata
Arunbank	18663	173	Container	2000/7/26	Lae, Papua New		Singapore, Singapore	Lombok-Karimata
Arunbank	18663	173	Container	2000/11/20	Lae, Papua New		Singapore	Lombok-Karimata
Arunbank	18663	173	Containor	2001/3/26	<u>Guinea</u> Lae, Papua New		Panjang Indonesia	
	20015	175	Com/Commo	2001/3/20	Guinea Fremantle		Kagoshima, Kagoshima,	
	30015	175	Car/Carry	2001/1/15	(Kwinana), Townsville,		Japan Penang (georgetown),	
Avalon	18108	169	General	2001/6/24	Australia Fremantle		Malaysia	Lombok-Karimata
Bader 111	26409	205	Livestock	2000/9/2	(Kwinana),		Adabiya, Egypt	Indian Ocean
Baltimar Boreas	2854	92	General	2001/4/9	Australia		Indonesia	
Banda Pearl	183	25	Fishing	2001/1/18	Kupang, Timor, Indonesia		Kupang, Timor, Indonesia	
Banda Pearl	183	25	Fishing	2001/5/11	Indonesia		Indonesia	
Bellatrix	4481	94	Livestock	2001/3/21	Fremantle (Kwinana),		Adabiya, Egypt	Indian Ocean
Californian Highway	43402	183	Car/Carry	2001/2/18	Fremantle (Kwinana),		Japan	IIIB2-IIIA-IIIA1
Camira	3246	86	Livestock	2000/8/14	Panjang, Indonesia		Muara, Brunei Darussalam	Lombok-Makasar
Camira	3246	86	Livestock	2000/11/17	Indonesia		Indonesia	
Carabao I	1487	70	Livestock	2001/3/11	Panjang, Indonesia		Klang, Malaysia	Lombok-Karimata
Carabao I	1487	70	Livestock	2001/5/3	Panjang, Indonesia		Surabaya, Indonesia	Lombok-Jawa
Carabao I	1487	70	Livestock	2001/6/18	Amamapare, Indonesia			
Carabao I	1487	70	Livestock	2001/6/19	Amamapare, Indonesia			
Carabao I	1487	70	Livestock	2001/6/23	Amamapare,			
Cattleya Ace	56823	199	Car/Carry	2000/8/17	Fremantle		Yokohama, Japan	IIIB2-IIIA-IIIA1

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Cec Fantasy	4980	101	Container	2000/7/22	Newcastle, Australia		Wyndham, Australia	
a			a		Newcastle, Australia Amamapare,			
Cec Fantasy	4980	101	Container	2000/8/16	Indonesia		Gladstone, Australia	
					Amamanare			
Cec Fantasy	4980	101	Container	2000/11/20	Indonesia		Newcastle, Australia	
					Amamanana			
Cec Fantasy	4980	101	Container	2001/1/1	Amamapare,		Gladstone, Australia	
Cas Eastania	4000	101	Contains	0001/0/04	Indonesia		A T 1	
Cec Fantasy	4980	101	Container	2001/3/24	Townsville,		Amamapare, Indonesia	
Cec Fantasy	4980	101	Container	2001/6/9	Amamapare,		Gladstone. Australia	
		-			Indonesia			
Cec Flash	2850	91	General	2000/11/19	Dampier, WA,		Singapore	Lombok-Karimata
					Australia		8-F	
Changsha	18391	185	Container	2000/8/8	Townsville,		Sumbawa, Indonesia	
Changsha	18391	185	Container	2000/8/30	Sumbawa Indonesia		Port Moresby, Papua	
Changsha	10001	100	container	2000/0/00	Sumbuwu, muonesiu		New Guinea	
Changsha	18391	185	Container	2000/10/9	Townsville,		Indonesia	
Changeho	10201	105	Containen	2000/11/4	Sumbarya Indonasia		Port Moresby, Papua	
Changsha	10391	165	Container	2000/11/4	Sumbawa, muonesia		New Guinea	
Changsha	18391	185	Container	2000/12/14	Townsville,		Sumbawa, Indonesia	
Changsha	18391	185	Container	2001/2/5	Townsville,		Sumbawa, Indonesia	
	10001	105	a	0004/0/00			Port Moresby, Papua	
Changsha	18391	185	Container	2001/2/23	Jakarta, Indonesia		New Guinea	
Changsha	18391	185	Container	2001/4/1	Townsville		Sumbawa Indonesia	
Changsha	18391	185	Container	2001/6/16	Gladstone Australia		Sumbawa Indonesia	
Chekiang	18391	185	Container	2000/8/22	Townsvillo		Sumbawa, Indonesia	
Chekiang	18391	185	Container	2000/10/23	Townsville		Indonesia	
	10001	100	Somuniti				Port Moreshy Panua	
Chekiang	18391	185	Container	2000/11/11	Sumbawa, Indonesia		New Guines	
Chekiang	18301	185	Container	2000/19/10	Townsville		Sumbawa Indonesia	
Chokiang	18201	185	Container	2001/2/18	Townsville		Sumbawa, Indonesia	├
Chokiang	18201	185	Container	2001/2/10	Townsville		Sumbawa, Indonesia	├
Chokiang	18201	185	Container	2001/4/12	Townsville,		Sumbawa, Indon	├
Cheklang	10291	165	Container	2001/3/27	Townsville,		Sumbawa, Indonesia	
Chenan	18391	185	Container	2000/7/26	Indonesia		N C	
Chaman	10001	107	Contains	2000/0/2			New Guinea	
Chenan	10391	100	Container	2000/9/2	Townsville,		Sumbawa, Indonesia	
Chenan	18391	185	Container	2000/11/2	i ownsville,		Indonesia Bent Menechy, Donus	
Chenan	18391	185	Container	2000/11/22	Sumbawa, Indonesia		N C	
Chaman	10001	107	Contribution	9001/1/9	T		New Guinea	
Chenan	18391	180	Container	2001/1/3	Townsville,			
Chenan	10391	165	Container	2001/3/2	Townsville,		Sumbawa, Indonesia	
Chenan	18391	185	Container	2001/3/20	Jakarta, Indonesia		Noresby, Papua	
Chanan	10201	105	Containan	2001/4/20	T		New Guinea	
Chenan	10391	105	Container	2001/4/30	Townsville,		Sumbawa, Indonesia	
Chengtu	18391	185	Container	2000/7/20	Townsville,		Indonesia	
Chengtu	18391	185	Container	2000/9/15	Townsville,		Indonesia	
Chengtu	18391	185	Container	2000/11/19	Townsville,		Indonesia	
Chengtu	18391	185	Container	2000/12/9	Sumbawa, Indonesia		Port Moresby, Papua	
<u>.</u>			<i>~</i>				New Guinea	
Chengtu	18391	185	Container	2001/1/19	Townsville,		Sumbawa, Indonesia	
Chengtu	18391	185	Container	2001/3/15	Townsville,		Sumbawa, Indonesia	
Chengtu	18391	185	Container	2001/5/19	Townsville,		Sumbawa, Indonesia	
Clipper Odyssey	5218	103	Cruise	2000/8/30	Bali, Indonesia		Sydney, Australia	
Clipper Odyssey	5218	103	Cruise	2001/3/28	Australia		Banda Aceh, Indonesia	
Codan	1453	69.2	Livestock	2000/8/8	Surabaya, Indonesia		Jakarta, Indonesia	Lombok-Jawa
Columbus	1 4002	144	Crusica	2001/2/15	Port Moresby, Papua		Bitung, Sulawesi,	
Columbus	14905	144	Cruise	2001/2/15	New Guinea		Indonesia	
Comoro River	4410	100	Container	2000/11/30	Gladstone, Australia		Dili, East Timor	IIIB2
Comoro River	4410	100	Container	2001/5/6	Gladstone, Australia		Dili, East Timor	IIIB2
Coral Princess	730	35	Cruise	2001/4/19	Panjang,		Jakarta,	Lombok-Jawa
Crown Odyssey	34242	188	Cruise	2001/1/27	Indonesia		Cairns, Australia	
Cuvier	130	22	Tug	2001/1/2	Shanghai,			
Dealco	4745	90	Livestock	2000/8/17	Pasir Panjang,		Karumha Australia	
Dealeo	1145	50	LIVESTOCK	~500/0/17	Indonesia			
Deutschland	22496	175	Cruise	2000/10/13	Australia		Bali, Indonesia	
Estancia	2199	72	Livestock	2001/4/21	Panjang, Indonesia		Panjang, Indonesia	
Estancia	2199	72	Livestock	2001/5/2	Panjang, Indonesia		Panjang, Indonesia	
Europa	28437	199	Cruise	2001/3/1				
Four Seasons	138	23	Prawning	2000/7/21				
Foylebank	18641	178	Container	2000/9/25	Papua New Guinea		Singapore	Lombok-Karimata
Foulabort	19641	170	Contain	2001/1/20	Lae, Papua New		Ponggoi Indona-t-	
Foylebank	18041	178	Container	2001/1/29	Guinea		Banggal, Indonésia	
Foulshank	10641	170	Containan	2001/5/25	Port Moresby, Papua		Daniang Indonesia	
royiebalik	10041	1/0	Container	2001/3/23	New Guinea		i anjang, muonesia	
Friesian Express	5218	109	Livestock	2001/3/17				
Friesian Express	5218	109	Livestock	2001/6/4				
Fukui Maru	147	36	Foreign Fi	2000/8/23	Indonesia		Indonesia	
Fukui Maru	147	36	Foreign Fi	2000/11/15	Indonesia		Indonesia	
Fukui Maru	147	36	Foreign Fi	2000/11/28	Indonesia		Indonesia	
Fukui Maru	147	36	Foreign Fi	2001/5/2	Indonesia		Indonesia	
0	00705	100	D/D ''	0000/0/02	Amamapare,			
Ganga Sagar	28739	190	D/Bulk	2000/9/30	Indonesia			
0.1001	101	50	D .	0000/11/10	Maningrida,		M	
Gulf Sky	401	52	вагge	2000/11/10	Australia		Maningrida, Australia	
H.m.n.z.s.Te Kaha	3600	118	Navy	2001/6/18	Sydney, Australia			
Helles Proster	97045	100	Dota-1	2000/0/22	Port Moresby, Papua		Wrmdhom Arret 1	
rienas Progress	27045	183	retroieum	2000/9/22	New Guinea		wynanam, Australia	
Helles Duration	97045	100	Dota-1	9000/10/00	Cape Lambert, WA,		Singanan	Lambal- V-
rienas Progress	21045	185	retroieum	2000/12/22	Australia		Singapore	Lombok-Karimata

Vessel	GRT	LOA	Ship's Type	Arrival Date	Last Port	Route1	Next Port	Route2
Jackaroo	6159	118	Livestock	2000/12/20			General Santos/dadiangas.	IIIB2-IIIA-IIIE1
Janet 1	4961	97	Livestock	2000/7/14	Gresik, Java, Indonesia		Cagayan De Oro, Mindanao, Philippines	IIIB2-IIIA-IIIE1
Janet 1	4961	97	Livestock	2000/7/26	Philippines		Jakarta, Indonesia	Lombok-Jawa
Kerry Express	5959	118	Livestock	2000/7/20	Panjang, Indonesia		Weipa, Australia	
Legend Of The Seas	69130	264	Cruise	2001/3/7	Cairns, Australia		Bali, Papua New Guinea	
Levin	4643	97	Livestock	2000/10/10	Panjang, Indonesia		Panjang, Indonesia	
Levin	4643	97	Livestock	2000/10/28	Panjang, Indonesia		Surabaya, Indonesia	Lombok-Jawa
Levin	4643	97	Livestock	2000/11/21	Indonesia		Indonesia	
Levin	4643	97	Livestock	2000/12/17	Panjang, Indonesia		Surabaya, Indonesia	Lombok-Jawa
Levin	4643	97	Livestock	2001/2/28	Singapore		Indonesia	
Levin	4643	97	Livestock	2001/3/19	Panjang, Indonesia		Denten e Indenesia	
Levin	4043	97	Livestock	2001/4/3	Panjang, Indonesia		Panjang, Indonesia	
Levin	4045	97	Livestock	2001/5/12	Panjang, Indonesia		Palijang, muonesia	
Maj Danielsen	3120	89	General	2001/2/28	Dampier, WA, Australia		Loloho, Papua New Guinea	IIID2-IIIA-IIIEI
Mariner	1655	82	Research	2000/9/9	Rigs, Australia		Balikpapan, Kalimantan, Indonesia	IIIB2-Makasar
Maxim Gorkiy	24220	195	Cruise	2001/3/20	Cairns, Australia		Bali, Indonesia	
Mercury Ace	44979	199	Car/Carry	2001/6/18	Fremantle (Kwinana),		Yokohama, Japan	IIIB2-IIIA-IIIA1
Molunat	1370	69	Livestock	2001/2/7	Cairns, Australia		Manila, Philippines	IIIB2-IIIA-IIIE1
Molunat	1370	69	Livestock	2001/4/14	Indonesia		Indonesia	
Molunat	1370	69	Livestock	2001/6/24	Indonesia		Cagayan De Oro,	IIIB2-IIIA-IIIE1
Morning Cono	11649	149	Cor/Corry	2000/7/25	Fremantle		Mindanao, Philippines	11109
Morning Cape	11046	140		2000/1/23	(Kwinana), Fremantle			
Nippon Highway	49212	180	Car/Carry	2000/9/15	(Kwinana), Thursday Island		Nagoya, Japan	IIIB2-IIIA-IIIA1
Norwegian Star	28018	206	Cruise	2000/8/8	Australia		Broome, Australia	
Norwegian Star	28018	206	Cruise	2000/8/30	Indonesia		New Guinea	
Ocean Achiever	133	25	Prawning	2000/9/13	Karumba, Australia		Karumba, Australia	
Olympia	3995	97	Cruise	2001/5/9	Enomontlo			
Orion Diamond	53251	215	Car/Carry	2001/4/17	(Kwinana),		Kanda, Fukuoka, Japan	IIIB2-IIIA-IIIA1
Orion Leader	32362	199	Car/Carry	2000/11/17	Fremantle (Kwinana),		Japan	IIIB2-IIIA-IIIA1
Pacific Pioneer	531	55	FV Supply	2001/5/14	Karumba, Australia		Karumba, Australia	
Pacstar	17275	174	General	2000/9/11	Townsville,		Penang (georgetown),	Lombok-Karimata
D. ID:	00045	0.40	<u> </u>	0001/0/10	Australia		Malaysia	
Regal Princess	69845	246	Cruise	2001/3/19	Cairns, Australia		Singapore	Lombok-Karimata
Riverside	480	50	вагде	2000/7/27	Fromontlo		Chasabusa nta Avsan	
Rockies Highway	47367	180	Car/Carry	2000/7/16	(Kwinana),		Chile	
Saga Rose	24474	189	Cruise	2001/3/8	Cairns, Australia		Indonesia	
Santandrea	170	30	Tug	2000/10/6	Cairns, Australia		Bali, Indonesia	Indian Ocean
Scan Atlantic	8821	127	Ro/Ro	2001/4/23	Indonesia		Gladstone, Australia	
Seven Seas Navigator	28000	171	Cruise	2000/10/26	Cooktown, Australia		Larantuka, Indonesia	
Seven Seas Navigator	28000	171	Cruise	2000/11/27	Larantuka,		Thursday Island,	
Sierra Nevada Highwa	47367	180	Car/Carry	2001/5/17	Fremantle (Kwinana),		Yokohama, Japan	IIIB2-IIIA-IIIA1
Silver Cloud	16927	156	Cruise	2001/3/26	Thursday Island, Australia		Indonesia	
Temburong	2614	90	Livestock	2001/1/9	Ternate, Halmahera,		Brunei, Brunei Darussalam	Lombok-Karimata
Temburong	2614	90	Livestock	2001/6/4	Ternate, Halmahera,		Jakarta, Indonesia	Lombok-Jawa
Tokyo Highway	45699	180	Car/Carry	2000/12/18	Fremantle (Kwinana),		Nagoya, Japan	IIIB2-IIIA-IIIA1
USNS Niagara Falls	15900	177	Navy	2001/6/29	Guam, FS of Micronesia		Dili, East Timor	IIIB2
USNS Spica	16792	160	Navy	2001/4/7	Guam, FS of Micronesia		Phuket, Thailand	Lombok-Karimata
Vindonissa	26028	186	Sulphur	2000/7/25	Malili, Sulawesi, Indonesia		Bundaberg, Australia	
Wiggins Tide	689	55	Rig Tender	2000/12/20	Port Moresby, Papua New Guinea		Singapore, Singapore	Lombok-Karimata
Wolfsburg	39187	183	Car/Carry	2001/3/20	Fremantle (Kwinana)		Japan	IIIB2-IIIA-IIIA1
Zebu Express	2513	82	Livestock	2000/10/21	Panjang, Indonesia		Jakarta, Indonesia	Lombok-Jawa

No.	Vessel	Trade	VOY.	Dep. Port	ETD	Arr. Port	ETA	Passing Route
1	Filaos	EXP	13	Baniarmasin	29-Mav	Hongkong	6-Jun	Karimata Strait
2	Ming Dinasty	IMP	322 E	Fos Sur Mer	24-May	Jakarta	17-Jun	Karimata Strait
3	Mare Internum	IMP	322 E	Fos Sur Mer	31-May	Jakarta	24-Jun	Karimata Strait
4	Haiphong Star	IMP	2002-03	Hongkong	12-May	Jakarta	20-May	Karimata Strait
5	Hyundai Sprinter	IMP	059 S	Hongkong	21-May	Jakarta	27-May	Karimata Strait
6	Shanghai Star	IMP	009	Hongkong	26-May	Jakarta	3-Jun	Karimata Strait
7	K.Singapore	IMP	105 S	Hongkong	28-May	Jakarta	3-Jun	Karimata Strait
8	Wan Hai 205	IMP	S 135	Hongkong	28-May	Jakarta	4- Jun	Karimata Strait
9	K. Singapore	IMP	105 S	Hongkong	29-May	Jakarta	31-May	Karimata Strait
10	Atlantic Trader	IMP	S 027	Hongkong	30-May	Jakarta	7- Jun	Karimata Strait
11	Recife	IMP	MR 20 S	Hongkong	30-May	Jakarta	5- Jun	Karimata Strait
12	Houston	IMP	51008	Hongkong	A. Jun	Jakarta	12-Jun	Karimata Strait
12	K Jakarta	IMD	104 S	Hongkong	4-Jun	Jakarta	10 Jun	Karimata Strait
14	Wan Hai 207	IMD	S 100	Hongkong	4-Jun	Jakarta	10-Juli 11 Jun	Karimata Strait
15	K Jakarta	IMD	104 S	Hongkong	4-Jun	Jakarta	7 Jun	Karimata Strait
16	Ming Champion		104 S	Hongkong	6 Jun	Jakarta	19 Jun	Karimata Strait
10	Warnow Trador		MP 30 5	Hongkong	6 Jun	Jakarta	12-Jun	Karimata Strait
10	Walliow Hadel		<u>5 020</u>	Hongkong	0-Jun	Jakarta	14-Jun	Karimata Strait
10	Hongo Nowik		060 5	Hongkong	11-Jun	Jakarta	17-Jun	Karimata Strait
19		IMP	5018	Hongkong	13-Jun	Surabaya	20-Jun	Karimata Strait
20 91	Kuo Hulig Mad Taiahung	IMP	GH 51 S	Hongkong	13-Jun	Jakarta	19-Jun	Karimata Strait
21	Med Taichung	IMP	46010	Hongkong	18-Jun	Jakarta	26-Jun	Karimata Strait
22	Ming Container	IMP	MT 54 S	Hongkong	20-Jun	Jakarta	26-Jun	Karimata Strait
23	La Seine	IMP	076 WP	Hongkong	9-Jul	Jakarta	17-Jul	Karimata Strait
24	Kuo Jane	IMP	KJ 107 S	Hongkong	12-Jul	Jakarta	18-Jul	Karimata Strait
25	Danu Bhum	IMP	CX 107 S	Hongkong	19-Jul	Jakarta	25-Jul	Karimata Strait
26	Konlink	IMP	CQ 106 S	Hongkong	26-Jul	Jakarta	1-Aug	Karimata Strait
27	Haiphong Star	EXP	2003 N	Jakarta	21-May	Hongkong	31-May	Karimata Strait
28	Hanjin Busan	EXP	233 N	Jakarta	22-May	Manila	24-May	Karimata Strait
29	Cap San Marco	EXP	117-05	Jakarta	26-May	Qingdao	2-Jun	Karimata Strait
30	Hyundai Sprinter	EXP	059 N	Jakarta	28-May	Hongkong	1-Jun	Karimata Strait
31	Hanjin Seoul	EXP	237 N	Jakarta	29-May	Manila	31-May	Karimata Strait
32	Heung-A Star	EXP	107 N	Jakarta	29-May	Hongkong	4-Jun	Karimata Strait
33	Wan Hai 203	EXP	N 140	Jakarta	30-May	Hongkong	7-Jun	Karimata Strait
34	Uni Obtain	EXP	0049-083	Jakarta	31-May	Hongkong	11-Jun	Karimata Strait
35	Pacific Trader	EXP	N 025	Jakarta	1-Jun	Hongkong	8-Jun	Karimata Strait
36	A.Rayamarga		17/2001	Jakarta	2-Jun	Pontianak	4-Jun	Karimata Strait
37	Adhiguna Jaya I		14/2001	Jakarta	2-Jun	Pontianak	4-Jun	Karimata Strait
38	VD.Virgo	EXP	12 AE	Jakarta	2-Jun	Hongkong	6-Jun	Karimata Strait
39	K.Singapore	EXP	105 N	Jakarta	4-Jun	Hongkong	8-Jun	Karimata Strait
40	KTMC Singapore	EXP	105 N	Jakarta	4-Jun	Hongkong	8-Jun	Karimata Strait
41	Merian	EXP	106 N	Jakarta	4-Jun	Hongkong	11-Jun	Karimata Strait
42	Hanjin Pohang	EXP	238 N	Jakarta	5-Jun	Manila	7-Jun	Karimata Strait
43	Doris Wulff	EXP	105 N	Jakarta	6-Jun	Hongkong	13-Jun	Karimata Strait
44	Recife	EXP	MR 20 N	Jakarta	6-Jun	Hongkong	13-Jun	Karimata Strait
45	Caraka JN III-31	EXP	23/2001	Jakarta	7-Jun	Batam	9-Jun	Karimata Strait
46	Hakuba Maru	EXP	015 B	Jakarta	7-Jun	Hongkong	11-Jun	Karimata Strait
47	Uni Orient	EXP	0050-080	Jakarta	7-Jun	Hongkong	18-Jun	Karimata Strait
48	A.Rayamarga		18/2001	Jakarta	9-Jun	Pontianak	11-Jun	Karimata Strait
49	Adhiguna Jaya I		15/2001	Jakarta	9-Jun	Pontianak	11-Jun	Karimata Strait
50	Bangkok Star	EXP	008 N	Jakarta	11-Jun	Hongkong	20-Jun	Karimata Strait
51	Haiphong Star	EXP	2000 N	Jakarta	11-Jun	Hongkong	21-Jun	Karimata Strait
52	K.Jakarta	EXP	104 N	Jakarta	11-Jun	Hongkong	15- Jun	Karimata Strait
53	KTMC Jakarta	EXP	104 N	Jakarta	11-Jun	Hongkong	15-Jun	Karimata Strait
54	Gloria I	EXP	108 N	Jakarta	12-Jun	Hongkong	19-Jun	Karimata Strait
55	Haniin Kwangvang	EXP	207 N	Jakarta	12- Jun	Manila	14- Jun	Karimata Strait
56	Rimba VII		10/2001	Jakarta	12- Jun	Makassar	15-Jun	Karimata Strait
57	Uni Fortune	FYP	0083-180	Jakarta	12- Jun	Hongkong	22- Jun	Karimata Strait
58	K Pusan	EYP	108 N	Jakarta	13. Jun	Hongkong	20. Jun	Karimata Strait
50	Ming Champion	EVP	MP 56 N	Jakarta	13-Jun	Hongkong	20-Jun	Karimata Strait
60	Uni Onward	EXP	0051_020	Jakarta Jakarta	14- Jun	Hongkong	25-Jun	Karimata Strait
61	Warnow Trador	EVD	N 097	Jakarta	14-Juli 15 Jun	Hongkong	20 Jun	Karimata Strall
62	A Rayamarda	LAP	10/2001	Jakarta	16 Jun	Dontional	20-JUII	Karimata Stralt
62	Adhiguna Java I		18/2001	Jakarta	10-JUII	Pontional	10-JUII	Karimata Stralt
64	Houng A Stor	EVD	10/2001	Jakarta	10-JUII 10 Tum	Longhand	10-JUII 95 Jun	Kanimata Strait
U4	ncung-ri Stai	L'AL	100 IN	Jakaila	10-JUII	TIOHYKONY	ພງ-Ju∏	nai illata Ətfalt

No.	Vessel	Trade	VOY.	Dep. Port	ETD	Arr. Port	ETA	Passing Route
65	Hyundai Sprinter	EXP	060 N	Jakarta	18-Jun	Hongkong	22-Jun	Karimata Strait
66	Haniin Busan		234 E	Jakarta	19-Jun	Manila	23-Jun	Karimata Strait
67	K.Ulsan	EXP	108 N	Jakarta	20- Jun	Hongkong	27- Jun	Karimata Strait
68	Kuo Hung	FXP	GH 51 N	Jakarta	20-Jun	Hongkong	27-Jun	Karimata Strait
69	Caraka JN III-31	FXP	25/2001	Jakarta	20 Jun 21- Jun	Batam	23- Jun	Karimata Strait
70	Rimba VII	1271	11/2001	Jakarta	21-Jun	Makassar	20 Jun 24- Jun	Karimata Strait
71	Uni Master	FVD	0084 234	Jakarta	21-Jun 21 Jun	Hongkong	24-Juli 20 Jun	Karimata Strait
72	Uni Obtain	EVD	0052 084	Jakarta	21-Juli 21 Jun	Hongkong	29-Juli	Karimata Strait
72	Hansa Namik	EAF	N 010	Jakarta	21-Juli	Honghong	2-Jui	Karimata Strait
73		EAP	IN 019	Jakarta	22-Jun	Hongkong	27-Juli	Karimata Strait
74	A.Rayallalga		20/2001	Jakarta	23-Jun	Pontianak	25-Jun	Karimata Strait
73	Adhiguna Jaya I		17/2001	Jakarta	23-Jun	Pontianak	25-Jun	Karimata Strait
76	Ming Container	EXP	MT 54 N	Jakarta	27-Jun	Hongkong	4-Jul	Karimata Strait
77	Uni Order	EXP	CD 108 N	Jakarta	28-Jun	Hongkong	7-Jul	Karimata Strait
78	Rimba VII		12/2001	Jakarta	30-Jun	Makassar	3-Jul	Karimata Strait
79	A.Victory	IMP	117 W	Kaohsiung	17-Jun	Jakarta	26-Jun	Karimata Strait
80	A.Fortune	IMP	162 W	Kaohsiung	1-Jul	Jakarta	10-Jul	Karimata Strait
81	Adhiguna Jaya I	EXP	13/2001	Pontianak	25-May	Jakarta	27-May	Karimata Strait
82	Adhiguna Raya Marga	EXP	16/2001	Pontianak	25-May	Jakarta	27-May	Karimata Strait
83	Adhiguna Jaya I	EXP	14/2001	Pontianak	31-May	Jakarta	2-Jun	Karimata Strait
84	Sinar Muda	EXP	112	Pontianak	31-May	Singapore	2-Jun	Karimata Strait
85	Adhiguna Raya Marga	EXP	17/2001	Pontianak	1-Jun	Jakarta	3-Jun	Karimata Strait
86	Sinar Muda	EXP	112	Pontianak	3-Jun	Singapore	5-Jun	Karimata Strait
87	Sinar Muda	EXP	113	Pontianak	5-Jun	Singapore	7-Jun	Karimata Strait
88	Adhiguna Jaya I	EXP	15/2001	Pontianak	6-Jun	Jakarta	8-Jun	Karimata Strait
89	Adhiguna Rava Marga	EXP	18/2001	Pontianak	8-Jun	Jakarta	10-Jun	Karimata Strait
90	Sinar Muda	EXP	113	Pontianak	8-Jun	Singanore	10-Jun	Karimata Strait
91	Adhiguna Raya Marga	FXP	19/2001	Pontianak	15- Jun	Jakarta	17- Jun	Karimata Strait
92	PAC Bangka	FYP	5083	Samnit	4- Jun	Singanoro	8. Jun	Karimata Strait
93	Caraka IN III-2	FYP	13	Sampit	5- Jun	Singapore	8-Jun	Karimata Strait
94	Caraka IN III-2	EVD	14	Sampit	15 Jun	Singapore	18 Jun	Karimata Strait
95	Sinar Surva	EVD	14	Samprong	13-Juli 19 Mov	Singapore	15 Mov	Karimata Strait
06	Sinar Sumba	EAF	052	Semanang	12-May	Singapore	13-May	Karimata Strait
90	Sinan Java	EAP	033	Semarang	18-May	Singapore	21-May	Karimata Strait
97	Sinar Sumba	EXP	114	Semarang	23-May	Singapore	20-May	Karimata Strait
98	Sinar Sumba	EXP	054	Semarang	25-May	Singapore	28-May	Karimata Strait
99	Sinar Sumba	EXP	054	Semarang	26-May	Hongkong	10-Jun	Karimata Strait
100	Angkor Star	EXP	008 N	Semarang	29-May	Hongkong	7-Jun	Karimata Strait
101	Sinar Java	EXP	115	Semarang	30-May	Singapore	2-Jun	Karimata Strait
102	Tiger River	EXP	07 N	Semarang	30-May	Singapore	2-Jun	Karimata Strait
103	Permai II	EXP	014	Semarang	31-May	Singapore	2-Jun	Karimata Strait
104	Permai II	EXP	014	Semarang	31-May	Singapore	2-Jun	Karimata Strait
105	Tiger River	EXP	07 N	Semarang	31-May	Singapore	6-Mar	Karimata Strait
106	Sinar Jambi	EXP	027	Semarang	1-Jun	Singapore	3-Jun	Karimata Strait
107	Sinar Sumba	EXP	055	Semarang	1-Jun	Singapore	4-Jun	Karimata Strait
108	Tiger River	EXP	07 N	Semarang	1-Jun	Singapore	3-Jun	Karimata Strait
109	Bhatra Bhum	EXP	309 N	Semarang	2-Jun	Singapore	5-Jun	Karimata Strait
110	Permai II	EXP	SR 014	Semarang	2-Jun	Singapore	5-Jun	Karimata Strait
111	Asian Bali	EXP	039	Semarang	3-Jun	Singapore	6-Jun	Karimata Strait
112	Grandeur	EXP	081 W	Semarang	3-Jun	Singapore	5-Jun	Karimata Strait
113	Lawanti	EXP	433	Semarang	3-Jun	Singapore	6-Jun	Karimata Strait
114	Sea Horse	EXP	416	Semarang	3-Jun	Singapore	5-Jun	Karimata Strait
115	Shanghai Star	EXP	009 N	Semarang	5-Jun	Hongkong	14- Jun	Karimata Strait
116	Lumoso Express	FYP	171	Semarang	6- Jun	Singanoro	9. Jun	Karimata Strait
117	Sinar Java	FYP	116	Semarang	6- Jun	Singapore	8. Jun	Karimata Strait
118	Sinar Timur	EXP	000	Somarang	6- Jun	Singapore	9. Jun	Karimata Strait
110	Tigor Divor	EVD	090 08 N	Semanang	6 Jun	Singapore	9-Juli	Karimata Strait
120	Dormai II	EAP	010	Semarang	0-JUII 7 Jun-	Singapore	9-JUII	Kanimata Stralt
120	Pormai II	EAP	010	Semarang	7 Jun	Singapore	0 Jun	Kanimata Stralt
161	rennan n Lowopti	EXP	016	Semarang	/-Jun	Singapore	9-Jun	Karimata Strait
122	Lawanti	EXP	435	Semarang	8-Jun	Singapore	11-Jun	Karimata Strait
123	Sinar Sumba	EXP	056	Semarang	8-Jun	Singapore	11-Jun	Karimata Strait
124	Bhatra Bhum	EXP	310 N	Semarang	9-Jun	Singapore	12-Jun	Karimata Strait
125	Sinar Surya	EXP	086	Semarang	9-Jun	Singapore	13-Jun	Karimata Strait
126	Sea Horse	EXP	418	Semarang	10-Jun	Singapore	12-Jun	Karimata Strait
127	Tiger River	EXP	09 N	Semarang	13-Jun	Singapore	16-Jun	Karimata Strait
128	Permai II	EXP	018	Semarang	14-Jun	Singapore	16-Jun	Karimata Strait

No.	Vessel	Trade	VOY.	Dep. Port	ETD	Arr. Port	ETA	Passing Route
129	Tiger River	EXP	10 N	Semarang	14-Jun	Singapore	16-Jun	Karimata Strait
130	Uni Fortune	EXP	0083-180	Semarang	14-Jun	Hongkong	22-Jun	Karimata Strait
131	Sea Horse	EXP	420	Semarang	17-Jun	Singapore	19-Jun	Karimata Strait
132	Permai II	EXP	020	Semarang	21-Jun	Singapore	22-Jun	Karimata Strait
133	Permai II	EXP	020	Semarang	21-Jun	Singapore	23-Jun	Karimata Strait
134	Tiger River	EXP	11 N	Semarang	21-Jun	Singapore	23-Jun	Karimata Strait
135	Uni Master	EXP	0084-234	Semarang	21-Jun	Hongkong	29-Jun	Karimata Strait
136	Tiger River	EXP	12 N	Semarang	28-Jun	Singapore	30-Jun	Karimata Strait
137	Sea Horse	EXP	HOR 424	Semarang	1-Jul	Singapore	3-Jul	Karimata Strait
138	Tiger River	EXP	13 N	Semarang	5-Jul	Singapore	7-Jul	Karimata Strait
139	Tiger Star	IMP	894 S	Singapore	31-May	Surabaya	1-Jun	Karimata Strait
140	Bunga Teratai	EXP	137	Singapore	6-Jun	Sydney	15-Jun	Karimata Strait
141	Tiger Star	IMP	895 S	Singapore	7-Jun	Surabaya	8-Jun	Karimata Strait
142	Sea Horse	IMP	419	Singapore	13-Jun	Semarang	15-Jun	Karimata Strait
143	Tiger Star	IMP	896	Singapore	13-Jun	Surabaya	15-Jun	Karimata Strait
144	Bunga Teratai 2	EXP	139	Singapore	14-Jun	Sydney	23-Jun	Karimata Strait
145	Sinar Surya	IMP	087	Singapore	14-Jun	Surabaya	16-Jun	Karimata Strait
146	Permai II	IMP	019	Singapore	17-Jun	Semarang	19-Jun	Karimata Strait
147	Jin Yu	IMP	133	Singapore	18-Jun	Surabaya	20-Jun	Karimata Strait
148	Permai II	IMP	019	Singapore	19-Jun	Semarang	21-Jun	Karimata Strait
149	Sea Horse	IMP	421	Singapore	20-Jun	Semarang	22-Jun	Karimata Strait
150	Tiger Star	IMP	897	Singapore	20-Jun	Surabaya	22-Jun	Karimata Strait
151	Sinar Surya	IMP	088	Singapore	21-Jun	Surabaya	23-Jun	Karimata Strait
152	Permai II	IMP	021	Singapore	24-Jun	Semarang	26-Jun	Karimata Strait
153	Jin Yu	IMP	134	Singapore	25-Jun	Surabaya	27-Jun	Karimata Strait
154	Sea Horse	IMP	423	Singapore	27-Jun	Semarang	29-Jun	Karimata Strait
155	Tiger Star	IMP	898	Singapore	27-Jun	Surabaya	29-Jun	Karimata Strait
156	Sinar Surya	IMP	089	Singapore	28-Jun	Surabaya	30-Jun	Karimata Strait
157	Permai II	IMP	023	Singapore	1-Jul	Semarang	3-Jul	Karimata Strait
158	Bunga Teratai 4	EXP	871	Singapore	3-Jul	Brisbane	14-Jul	Karimata Strait
159	Sea Horse	IMP	425	Singapore	4-Jul	Semarang	6-Jul	Karimata Strait
160	Permai II	IMP	025	Singapore	8-Jul	Semarang	10-Jul	Karimata Strait
101	Sinar Surya	EXP	082	Surabaya	14-May	Singapore	16-May	Karimata Strait
102	Merian Teamon Commondon	EXP	105 N	Surabaya	16-May	Hongkong	21-May	Karimata Strait
103	Sinon Timun	EXP	340112	Surabaya	17-May	Singapore	30-May	Karimata Strait
104		EXP	083	Surabaya	19-May	Singapore	21-May	Karimata Strait
166	Cloria I	EAP	107 N	Surabaya	24-May	Singapore	20 May	Karimata Strait
167	Sipar Timur		107 IN	Surabaya	20-May	Hongkong	30-May	Karimata Strait
168	Bormudian Expross	EAP	008 N	Surabaya	20-May	Singanana	20 Mov	Karimata Strait
160	Sinar Surva	EVD	0081	Surabaya	20-101ay	Singapore	20 May	Karimata Strait
170	Uni Obtain	EAF	0040 083	Surabaya	20 Mov	Singapore	2 Jun	Karimata Strait
171	Cambodia Star	EXP	SSS 006	Surabaya	20-May	Singapore	2-Juli 1. Jun	Karimata Strait
172	Heung-A Asia	LAI	107 F	Surabaya	30-May	Hongkong	1-Jun	Karimata Strait
173	Pacific Trader	ЕХР	N 025	Surahaya	30-May	Hongkong	8- Jun	Karimata Strait
174	Kota Berani	EXP	BRN 268	Surabaya	31-May	Singanore	2-Jun	Karimata Strait
175	Lumoso Express	EXP	170	Surahava	31-May	Singapore	2- Jun	Karimata Strait
176	Piva Bhum	EXP	203 N	Surabaya	31-May	Singanore	3-Jun	Karimata Strait
177	Tasman Challenger	EXP	340113	Surabaya	31-May	Singapore	12-Mav	Karimata Strait
178	Jin Yu	EXP	130	Surabaya	1-Jun	Singapore	4-Jun	Karimata Strait
179	KTMC Ulsan	EXP	107 N	Surabaya	1-Jun	Hongkong	6-Jun	Karimata Strait
180	Caraka JN III-8		22	Surabava	2-Jun	Makassar	4-Jun	Karimata Strait
181	Manise		11	Surabava	2-Jun	Samarinda	4-Jun	Karimata Strait
182	Sinar Timur	EXP	085	Surabaya	2-Jun	Singapore	4-Jun	Karimata Strait
183	Uni Master	EXP	0081-233	Surabava	2-Jun	Hongkong	8-Jun	Karimata Strait
184	Asian Bali		5	Surabava	3-Jun	Makassar	5-Jun	Karimata Strait
185	Ayu Baru	EXP	12	Surabaya	3-Jun	Hongkong	6-Jun	Karimata Strait
186	Caraka JN III-27		16	Surabaya	3-Jun	Samarinda	5-Jun	Karimata Strait
187	Filaos	EXP	13	Surabaya	3-Jun	Hongkong	6-Jun	Karimata Strait
188	Kota Berlian	EXP	BRL 260	Surabaya	3-Jun	Singapore	<u>5-Ju</u> n	Karimata Strait
189	Manjur Baru	EXP	09	Surabaya	3-Jun	Hongkong	6-Jun	Karimata Strait
190	Mirah		14	Surabaya	3-Jun	Samarinda	5-Jun	Karimata Strait
191	Teman Baru	EXP	03	Surabaya	3-Jun	Hongkong	6-Jun	Karimata Strait
192	Tiger Star	EXP	894	Surabaya	3-Jun	Singapore	6-Jun	Karimata Strait

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No. Vessel	Trade	VOY.	Dep. Port	ETD	Arr. Port	ETA	Passing Route
193 Wan Hai 203	EXP	N 140	Surabaya	3-Jun	Hongkong	7-Jun	Karimata Strait
194 Bahamian Express		013 E	Surabaya	4-Jun	Singapore	6-Jun	Karimata Strait
195 Caraka Jaya Niaga III 3	EXP	005 S	Surabaya	4-Jun	Singapore	15-Jun	Karimata Strait
196 Sinar Surya	EXP	085	Surabaya	4-Jun	Singapore	7-Jun	Karimata Strait
197 Uni Orient	EXP	0050-080	Surabaya	5-Jun	Singapore	9-Jun	Karimata Strait
198 Gloria I		107 E	Surabaya	6-Jun	Hongkong	11-Jun	Karimata Strait
199 Merian	EXP	106 N	Surabaya	6-Jun	Hongkong	10-Jun	Karimata Strait
200 Kota Berani	EXP	BRN 270	Surabaya	7-Jun	Singapore	9-Jun	Karimata Strait
201 Lumoso Express	EXP	171	Surabaya	7-Jun	Singapore	9-Jun	Karimata Strait
202 Piya Bhum	EXP	204 N	Surabaya	7-Jun	Singapore	10-Jun	Karimata Strait
203 Jin Yu	EXP	131	Surabaya	8-Jun	Singapore	11-Jun	Karimata Strait
204 Solo Sun	EXP	13	Surabaya	8-Jun	Hongkong	10-Jun	Karimata Strait
205 Manise		12	Surabaya	9-Jun	Samarinda	11-Jun	Karimata Strait
206 Sinar Timur	EXP	086	Surabaya	9-Jun	Hongkong	24-Jun	Karimata Strait
207 Uni Forward	EXP	0082-185	Surabaya	9-Jun	Hongkong	15-Jun	Karimata Strait
208 Mirah		15	Surabaya	10-Jun	Samarinda	12-Jun	Karimata Strait
209 Tiger Star	EXP	895	Surabaya	10-Jun	Singapore	13-Jun	Karimata Strait
210 Tiger Star	EXP	895	Surabaya	10-Jun	Singapore	12-Jun	Karimata Strait
211 Tiger Star	EXP	895	Surabaya	10-Jun	Singapore	13-Jun	Karimata Strait
212 Wan Hai 205	EXP	N 136	Surabaya	10-Jun	Hongkong	14-Jun	Karimata Strait
213 Conti France		019 E	Surabava	11-Jun	Singapore	13-Jun	Karimata Strait
214 Sinar Surya	EXP	086	Surabaya	11-Jun	Singapore	14-Jun	Karimata Strait
215 Triumph	EXP	020 N	Surabava	11-Jun	Singapore	14-Jun	Karimata Strait
216 Caraka Jaya Niaga III 2	EXP	001 S	Surabaya	13-Jun	Singapore	24-Jun	Karimata Strait
217 Gloria I	IMP	108 N	Surabaya	13-Jun	Hongkong	18-Jun	Karimata Strait
218 Tasman Campaigner	EXP	340114	Surabaya	13-Jun	Singapore	25-May	Karimata Strait
219 Kota Berani	EXP	BRN 274	Surabaya	14- Jun	Singapore	16-Jun	Karimata Strait
220 Jin Yu	EXP	132	Surabaya	15-Jun	Singapore	18-Jun	Karimata Strait
221 Uni Fortune	EXP	0083-180	Surabaya	16-Jun	Hongkong	22- Jun	Karimata Strait
222 Silver Island	EXP	AQ 101 N	Surabaya	17-Jun	Hongkong	24- Jun	Karimata Strait
223 Tiger Star	EXP	896	Surabaya	17-Jun	Singanore	19- Jun	Karimata Strait
224 Wan Hai 207	EXP	N 110	Surabaya	17-Jun	Hongkong	21-Jun	Karimata Strait
225 Kota Berlian	EXP	BRI 264	Surabaya	18-Jun	Singanore	20- Jun	Karimata Strait
226 Uni Obtain	FXP	0052-084	Surabaya	10-Jun	Singapore	23- Jun	Karimata Strait
227 Caraka Java Niaga III 3	EXP	006 \$	Surabaya	20. Jun	Singapore	1. Jul	Karimata Strait
228 Heung-A Star	EXP	108 N	Surabaya	20-Jun 20-Jun	Hongkong	24. Jun	Karimata Strait
229 Kota Berani	EXP	BRN 276	Surabaya	20-Jun 21. Jun	Singanoro	23. Jun	Karimata Strait
230 Uni Master	EXP	0084-234	Surabaya	23. Jun	Hongkong	29-Jun	Karimata Strait
231 Heung-A Singapore	EXP	GS 102 N	Surabaya	24- Jun	Hongkong	30-Jun	Karimata Strait
232 Wan Hai 202	EXP	N 145	Surabaya	24-Jun	Hongkong	28. Jun	Karimata Strait
233 Bermudian Express	EXP	110 NB	Surabaya	25- Jun	Singanoro	27-Jun	Karimata Strait
234 Kota Berlian	EXP	BRN 266	Surabaya	25-Jun	Singapore	27-Jun	Karimata Strait
235 Tasman Crusader	EVD	240115	Surabaya	26 Jun	Singapore	$\frac{\lambda T}{J}$	Karimata Strait
236 Merian	EVD	107 N	Surabaya	20-Juli 27 Jun	Hongkong	11-Jul 1 Jul	Karimata Strait
237 Caraka Java Niaga III 2	EAF	107 IN	Surabaya	20 Jun	Singanara	10 Jul	Karimata Strait
239 Doris Wulff	EAP	100 N	Surabaya	29-Jun	Jingapore	10-Jui 4 I.J	Karimata Strait
230 Uni Order	EAP	100 IN	Surabaya	29-Jun	Honghang	4-JUI 7 J1	Karimata Strait
239 Ull Oldel	EXP	CD 108 N	Surabaya	I-Jul	Hongkong	7-Jul	Karimata Strait
240 Kula Del alli	EXP	DKIN 280	Surabaya	o T I	Singapore	/-JUI	Karimata Strait
241 NUILLIIK	EXP	CQ 105 N	Surabaya	8-Jul	Hongkong	14-Jul	Karimata Strait
242 Nota Derilan	EXP	BKN 270	Surabaya	9-Jul	Singapore	11-Jul	Karimata Strait
243 Tasman Commander	EXP	340116	Surabaya	16-Jul	Singapore	30-Jul	Karimata Strait
244 Kota Berani	EXP	BRN 284	Surabaya	19-Jul	Singapore	ZI-Jul	Karimata Strait
245 Kota Berlian	EXP	BRN 274	Surabaya	23-Jul	Singapore	25-Jul	Karimata Strait
246 Kota Berani	EXP	BRN 287	Surabaya	2-Aug	Singapore	4-Aug	Karimata Strait

No.	Date	Time	Time	Location	Latitude	Longuitud	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading	Remarks
1	31-Jan-94	22:30	Zone WIB	Pier of Tg. Perak		e	3,290	Cargo	Indonesia	Fire / Sunken	Nil	Loss (Ton) 1,500	
2	21-Feb-94	08:00	WITA	Flores Sea			562	Cargo	Honduras	Main Engine	Nil	Nil	
3	23-Feb-94	23:10	WITA	SE of Sulawasi Is.			337 *	Cargo	Indonesia	Sunken	Nil	175	
4	23-Feb-94	02:25	WIB	Seram Sea			127	Fishing Boat	Indonesia /	Die of Crew	1	Nil	/ Under
5	26-Feb-94	07:00	WIB	Pier of Tg. Perak				Passenger	Indonesia	Collision	Nil	Nil	mooring
6	01-Mar-94	03:30	WIB	Jawa Sea			117	Fishing Boat	Indonesia	Die of Crew b/o sick	1	Nil	
7	03-Mar-94	03:03	No Data		07-22-00S	120-35-00	6	Cargo	Indonesia	Sunken	Nil	16	Troiled by
8	04-Mar-94	06:00	WIB		01-24-00S	120-35-00	1,421	Barge	Singapore	Load and crew	1	1,800	TB Merlin
9	05-Mar-94	15:45	WIB	To Perak Port			6 975	Container	Indonesia	Sunken	Nil	3 125	(S'pore)
10	06-Mar-94	22:30	WIB	ig. i clak i ort	06-38-30S	118-38-30	119	Cargo	Indonesia	Stranding	Nil	Nil	
11	09-Mar-94	01:00	WIT				7,240 * / 3	Boat	Panama / Indonesia	Collision	Nil / Nil	Nil / 0.5	
10	10.14 04	14.15	11/17/1				10,400	G	T 1 ·	Flooding &	N.11	N.11	Collide to
12	10-Mar-94	14:15	WITA	Benoa Port			10,483	Cargo	Indonesia	Stranding	Nil	Nil	No Data object
13	15-Mar-94	20:10	WIB	Batanghari River			1,135 */ 1,423	Cargo / Cargo	Indonesia /	Collision	Nil	Nil	
14	16 Mar 94	13.05	WIB	Surabaya Kalimas			308 * / 757 *	Cargo / Form	Indonesia /	Collision	Nil	Nil	
14	10-1411-34	13.05	WID	Channel			336 / 131	Cargo / Perry	Indonesia /	Consion	NI	NI	
15	20-Mar-94	19:30	WIB		00-55-45N	104-22-10	6	Speed Boat	Indonesia	Collision	Nil	Nil	
16	29-Mar-94	06:00	WITA	Off Central Sulawesi Is.			282	Cargo	Indonesia	Fire	Nil	50	
17	03-Apr-94	12:55	WITA		03-36-30N	103-34-40	3,256	Container	Indonesia	Stranding	Nil	Nil	
18	04-Apr-94	04:20	WIB		08-21-00S	110-50-00	45	Fishing Boat	Indonesia	Collision	1 / No Data	Nil / No Data	Hit and run
19	09-Apr-94	22:05	WIB	Pekanbaru Port			453	Cargo	Indonesia	Sunken	Nil	515	
20	09-Apr-94	11:50	WITA	LABUHAN	08-30-00S	115-45-00	485	Ferry	Indonesia	Collision to Pier	Nil	Nil	
21	10-Anr-94	02:00	WITA	LOMBOK near Salavar Is			34	Cargo	Indonesia	Sunken	3	Nil	
22	15-Apr-94	21:30	WIB	Pier of Tg. Perak			3350 *	Cargo	Indonesia	Sunken	Nil	Nil	
23	15-Apr-94	04:25	WIB	Sentosa Strait / Singapore			157	Cargo	Indonesia	Fire	3	Nil	
24	19-Apr-94	02:14	WIB	B lt Ci - ti	00-51-30N	103-34-40	2,853	Tanker	Singapore	Stranding	Nil	Nil	
25	19-Apr-94	20:15	WIB	Ball Strait		-	2/5	Speed Boat / Speed	Indonesia /	Calliaian	51	100	
20	19-Apr-94	11:05	WIIA	Manakam Kiver			4 7 6	Boat	Indonesia	Collision	INII	INII	
27	22-Apr-94			Sampit River			5 / 2	Boat / Speed Boat	Indonesia	Collision	Nil / 1	Nil	
28	23-Apr-94	03:15	WITA	Near south Kalimantan			395 *	Cargo	Indonesia	Fire	Nil	Nil	
29	23-Apr-94	06:30	WIB	Rammantan	06-16-00S	114-27-00	468 *	Cargo	Indonesia	Sunken	Nil	155	
30	27-Apr-94	14:30	WIB	Channel to Pontianak			125 * / No Data	Cargo / Row Boat	Honduras / No Data (IND)	Collision	Nil / 1	Nil	/ Sunken
31	29-Apr-94	04:00	WITA	Mahakam River			100 */ 43 *	Cargo / Cargo	Indonesia /	Collision	5 / Nil	1 / Nil	Sunken /
00		00.45	WID	Indrapura Sri Siak			2,350 * / 97	Cargo / Tug Boat +	Indonesia / Indonesia /	C 11: -	N.''l	N.''	
32	30-Apr-94	06:45	WIB	River			+1,399	Barge	Singapore	Collision	N11	N11	
34	02-May-94 05-May-94	06:00	WII	Merauke Fort	02-40-00N	124-00-00	459	Cargo	Honduras	Fire	Nil	Nil	
35	14-May-94	08:30	WITA	Makassar Strait	05-03-015	106-27-05	494 *	Cargo	Indonesia	Sunken	Nil	150 of cows	
37	16-May-94	19:35	WIB		02-05-48S	106-10-57	175	Cargo	Indonesia	Stranding	Nil	Nil	b/o flooding
38	19-May-94	01:20	WIB	near Mandalika Is.			607	Cargo	Indonesia	Fire	3	Nil	Sunken No
39	20-May-94	16:30	WIB	near Sipora Is.			2 *	Row Boat	Indonesia	Sunken	8	Nil	identificati
40	22-May-94	20:00	WIB	south of Segama Is.			50 *	Cargo	Indonesia	Sunken	Nil	50	on
41	25-May-94	02:10	WIB	Pier of Tlk. Bayur			2,269 *	Cargo	Indonesia	Sunken	Nil	122	
42	26-May-94	11:30	WIB	Port/Semarang			3,258	Container	Indonesia	Fire	Nil	Nil	
43	03-Jun-94	03:00	WIB		02-24-52S	099-51-18	27	Cargo	Indonesia	Stranding	Nil	Nil	No shipmaster
44	03-Jun-94	06:30	WIB	Off Karimun Jawa			25	Cargo	Indonesia	Sunken	Nil	150	Timber
45	05 Jun 04	18:40	WID	/Semarang			10.676 / 16.007	Canda / Canda	Singapore /	Colligion	NH	NH	Manoeuvre
43	03-3 411-94	10:40	WID	TIK DAYUF POFT			13,070 / 10,097	Cargo / Cargo	India Singapore /	Comsion	1111	1111	problem
46	10-Jun-94	14:30	WIB	Pier of Tg. Priok			377 * / 5	Cargo / Boat	Indonesia	Collision	Nil / 2	Nil / Nil	/ Sunken
47 48	11-Jun-94 12-Jun-94	02:00	WIB	Jawa Sea Off Tuban/Jatim			350 *	Cargo	Indonesia Indonesia	Sunken Sunken	Nil Nil	175 63 *	Timber
49	15-Jun-94	05:00	WIB		01-09-20S	103-55-38	6 / No Data	Row Boat / Cargo	Indonesia /	Collision	Nil / Nil	Nil / Nil	
50	17 Jun 04	16.00	WIT	South of Seram /			97 *	Carro	Honduras	Suplan	9	91	Bulk congr
50	17-Jun-94	10:00	VV11	Maluk Batu Ampar Port /			0/ *	Cargo	muonesia	Sunken	۵	21	Linder
51	18-Jun-94	02:30	WIB	Batam			27	Cargo	Honduras	Sunken	Nil	Nil	mooring
52 53	20-Jun-94 21-Jun-94	16:30 06:00	WIB WIB	Off Karimun Jawa	00-33-19N	101-27-19	176 50 *	Cargo Cargo	Indonesia Indonesia	Stranding Sunken	Nil Nil	260 Nil	Sunken
54	21-Jun-94	02:00	WIB	Malacca			34	Cargo	Indonesia	Sunken	Nil	28	
55	21-Jun-94	06:30	WIB	Strait/Halang Is.	03- <u>15-</u> 30S	106-13-00	149	Cargo	Indonesia	Sunken	Nil	148	Timber
56	22-Jun-94	16:00	WIB	Gresik Port /			402	Cargo	Indonesia	Fire	Nil	165	Sunken
57	22-Jun-94	18:00	WIB	Sulavaya	02-46-08S	109-26-32	581 *	Cargo	Indonesia	Sunken	Nil	250 *	Timber
58 59	23-Jun-94 28-Jun-94	00:30	WIB WIB	Jawa Sea	02-04-48S	106-10-36	472 * 150	Cargo Cargo	Indonesia Indonesia	Stranding Sunken	Nil Nil	Nil Nil	
60	03-Jul-94	22:00	WITA		07-34-00S	115-20-00	295 *	Cargo	Indonesia	Sunken	Nil	222	Timber
61 62	03-Jul-94 03-Jul-94	11:10 15:30	WIB		01-01-35S 01-37-00N	100-21-20 101-58-30	910 7	Cargo Boat	Indonesia Indonesia	Stranding Fire	Nil 4	Nil Nil	Flooding Sunken
63	03-Jul-94	12:25	WIB		05-53-10S	108-38-30	123	Cargo	Indonesia	Sunken	3 N ²¹	97	Timber
04 65	05-101-94	22:00 00:00	WITA	<u> </u>	07-34-035	107 02 45	19 * / No Dote	Uargo Fishing boat / No Det-	Indonesia / No	Collision	NII 3 / No Dot-	د م Fishing net	/ Hit and
00	05-Jui-94	00.00	WID	Pangkal Balam	00-00-005	107-02-43	10 / INU D'ALA	i isning boat / 190 Data	Data	Comsion	J IND DALA	/ No Data	run
66	06-Jul-94	19:00	WIB	Channel			69	Cargo	Indonesia	Stranding	Nil	Nil	
67	06-Jul-94	05:30	WIB	104/105 Pier of Tlk	01-41-10S	106-07-00	371 *	Cargo	Indonesia	Sunken	Nil	162	Sand
68	06-Jul-94	14:17	WIB	Bayur Bay Bay Bay (05			5,291	Cargo	Indonesia	Collision to Pier	Nil	Nil Nil / N	/ 11:4 - 1
69	11-Jul-94	00:00	WITA	of Sulawesi Is.			7 / No Data	Cargo / No Data	Data / No	Collision	7 / No Data	Data	/ Filt and
70	16-Jul-94	04:00	WIB	East sea area of Bawean Is			No Data	Cargo	Indonesia	Sunken	Nil	400	Timber

No.	Date	Time	Time Zone	Location	Latitude	Longuitud e	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
71 72	17-Jul-94 28-Jul-94	17:00 19:30	WIB	Wetar Strait	00-31-20N	103-38-24	15 6	Cargo Cargo	Indonesia Indonesia	Sunken Engin Trouble & Stranding	4	Nil	
73	01-Aug-94	15:30	WIB	Pier B of Panjang Port			4,804 *	Cargo	Indonesia	Flooding & Sit on sea bed	Nil	Nil	Human careless
74	02-Aug-94	12:30	WITA	Larantuka waters (NTT)			2	Fishing Boat	Indonesia	Sunken	7	Nil	No Documents & Identificati on
75 76	06-Aug-94 09-Aug-94	12:00 14:30	WIB WIB	North of Bangka Is.	05-34-00S	109-44-30	6 167	Boat Cargo	Indonesia Indonesia	Sunken Sunken	Nil Nil	Nil 484	
77	10-Aug-94	15:00	WIB	North Coast of Palembang			50 *	Sail Cargo	Indonesia	Sunken	Nil	1	Rice
78	10-Aug-94	22:10	WIB		06-04-00S	107-40-22	85	Wooden Cargo	Indonesia	Stranding and Sunken	Nil	8 ton / 150 *	Pepper / Timber
79	11-Aug-94	02:00	WIB	10 NM to South from Segama Is.			No Data	Cargo	Indonesia	Sunken	Nil	150 *	
80	11-Aug-94	15:00	WIB	Jawa Sea / North of Bawean Is.			420 *	Cargo	Indonesia	Sunken	Nil	120	
81	12-Aug-94	06:00	WIB	Jawa Sea / West of Bawean Is.			No Data	Cargo	Indonesia	Sunken	5	272 *	
82	14-Aug-94	04:20	WITA	Jamrud Pier of	02-46-00N	118-21-00	No Data 2 542	Passenger and Cargo	Indonesia	Fallen to sea	1 Nil	Nil	Cloves
84	21-Aug-94	01:15	WIB	Surabaya	05-36-00S	116-45-00	1,409 *	Cargo	Indonesia	Sunken	7	950	Cloves
85	24-Aug-94	18:45	WIB	Pasir Port / Panjang			70	Tug Boat	Honduras	Sunken	Nil	Nil	Under mooring
86 87	25-Aug-94 26-Aug-94	11:30 01:30	WITA WITA	Pier of Dili Port	05-41-02S	132-51-52	46 * 3,344 *	Passenger and Cargo Cargo	Indonesia Indonesia	Sunken Collision to Pier	2 Nil	1 Nil	
88	26-Aug-94	22:20	WIB	Pier of Tg. Priok			2,758	Tanker	Indonesia	Stranding	Nil	Nil	Over ship's hull
89 90	28-Aug-94 30-Aug-94	22:00 12:00	WIB WITA	Pier of Dili Port	05-10-00S	111-45-00	168 2,313	Cargo Cargo	Indonesia Indonesia	Sunken Collision to Pier	Nil Nil	350 * Nil	Timber
91	30-Aug-94	04:00	WIB		07-50-00S	107-39-50	208	Cargo	Indonesia	Flooding and Stranding	Nil	Nil	
92	30-Aug-94	08:00	WITA	Mouth of Pegah river, Samarinda			420 *	Cargo	Indonesia	Stranding	Nil	Nil	
93	31-Aug-94	02:00	WIB	South of Mandalika Is.			6	Fishing Boat	Indonesia	Sunken	2	Nil	No license
94	01-Sep-94	19:00	WIB	Batanghari River Channel			217 / 16	Tug Boat / Cargo	Indonesia / Indonesia	Collision	Nil / Nil	Nil / 15 *	/ Sunken
95	02-Sep-94	04:00	WITA	Dili Port			11	Boat	No Data	Sunken	1	Nil	No License & ships document
96	03-Sep-94	12:30	WIB	Batanghari River Channel			6 / 2.3 *	/ Speed Boat	Indonesia / Indonesia	Collision	Nil / 5	Nil / Nil	/ Sunken
97 98	04-Sep-94	05:15 23:30	WITA	Kalimas Pier of	08-18-10S	123-02-10	416	Cargo	Indonesia	Sunken	Nil	Nil	
99	10-Sep-94	03:00	WIB	Surabaya	07-46-00S	109-18-15	3	Cargo	Indonesia	Sunken	8	Nil	
100	11-Sep-94	00:00	WIB		03-02-00S	106-15-06	69	Cargo	Indonesia	Stranding	Nil	101	missing from stranding position
101	13-Sep-94	14:50	WITA	Channel to Bau Bau Port			84	Cargo	Indonesia	Fire	Nil	Nil	
102	13-Sep-94	12:00	WIB	Sari Coast, Pekalongan			15		Indonesia	Stranding	Nil	Nil	
103	24-Sep-94	06:50	WIB	Mouth of Kuala Pembuang River			1	Speed Boat	Indonesia	Sunken	Nil	Nil	
104	28-Sep-94	17:00	WIB	Pangkal Balam Channel			25 *	Barge	Indonesia	Sunken	Nil	Nil	Trailed by TB KT.
105	03-Oct-94	03:30	WIB	Mouth of Kahayan river/ at No.II Buoy			90	Cargo	Indonesia	Flooding & Sunken	Nil	17	
106	14-Oct-94 15-Oct-94	03:10	WITA	Shoal of Barito	06-27-305	105-42-00	6,022	Passenger Fishing boat / Fishing	Indonseia Indonesia /	Stranding Collision	Nil	Nil Nil	Sunken /
108	21-Oct-94	10:30	WIB	Batanghari River			240 / 2.761 *	Boat Cargo / Tanker	Indonesia Indonesia /	Collision	Nil	Nil	
109	22-Oct-94	11:00	WIB	Channel of Jambi			522 / 522	Barge / Barge	Indonesia Singapore /	Collision	2	Nil	
110	24-Oct-94	Nil	Nil	Belawan Harbour			4.999	Cargo	Singapore	Stranding	Nil	Nil	
111	28-Oct-94	19:30	WITA	Waters Pier of Tri Sakti/			86	Barge	Indonseia	Sunken	Nil	Nil	
112	31-Oct-94	02:50	WITA	Banjarmasin	03-36-29S	114-27-39	6,022	Passenger	Indonesia	Stranding	Nil	Nil	
113	02-Nov-94			West side of Sei Barito Channel			6,022		Indonesia	Stranding	Nil	Nil	Under
114	07-Nov-94	19:00	WIB	mouth of Kluwut	01.0C.00N	100 40 00	3	Fishing boat	Indonesia	Fallen to sea	1	Nil	fishing
115	09-Nov-94	09:20	WIB	Pier of Tg. Perak	01-00-00IN	103-43-22	998 / 2,903	Cargo / Cargo	Indonesia /	Collision	Nil / 1	Nil / Nil	/
117	11-Nov-94	00:53	WIT	Port of Surabaya	00-35-05N	127-29-05	43,913 * / 26	Passenger / Cargo	Indonesia Indonesia /	Collision	Nil / 8	Nil / 3,875	/ Sunken
118	11-Nov-94	20:30	WIB		01-20-00S	103-33-20	No Data / 34	No Data / cargo	No Data /	Collision	No Data /	No Data /	Hit and
119	15-Nov-94	23:00	WIB	West Channel			141	Cargo	Indonesia	Sunken	Nil	202	run /
120	16-Nov-94	22:00	WITA	near Laut Is.			6 / No Data	Fishing Boat / No	Indonesia	Collision and	Nil /	Nil /	/ Hit and
121	16-Nov-94	14:00	WIB	West side of			20 *	Passenger and Cargo	Indonesia	Stranding & Broken	Nil	Nil	1 111
122	27-Nov-94	19:08	WIB	Sumularig 15.			490 / No Data	Cargo / #####	Indonesia /	Collision	Nil / 5	Nil / 2	/ Sunken
123	03-Dec-94	07:25	WIB	South of Tg. Marangbolo of Seliu Is.			269	Cargo	Indonesia	Stranding	Nil	100	
124	03-Dec-94	13:00		West Coast of Sumatera			180	Tug Boat	Honduras	Engine Trouble	Nil	Nil	
125	13-Dec-94	19:30	WIB	Lumu-Lumu waters/ South			130	Fishing Boat	Indonesia	Die of crew	1	Nil	Sick
126	14-Dec-94	15:00	WITA				145	Cargo	Indonesia	Stranding	Nil	20	Heavy
127	16-Dec-94	15:41	WIT	Pier of Soasio			2,547 *	Cargo and Passenger	Indonesia	Collision to Pier	Nil	Nil	broken of pier
128	16-Dec-94	13:00	WIB		05-58-00S	111-50-08	101	Fishing Boat	Indonesia	Sunken	Nil	35	

No.	Date	Time	Time Zone	Location	Latitude	Longuitud	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading	Remarks
129	17-Dec-94	00:30	WIB	5 NM off to west from Talise Is.			34 / 34	Passenger / Passenger	Indonesia / Indonesia	Collision	Nil / 6	Nil / 5	
130	18-Dec-94	06:00	WIT	b/w Manukang Is. & Gunung Ani Is.			46	Cargo	Indonesia	Sunken	22	16	
131	23-Dec-94	17:30	WIB	Off Cilacap Special Pier of			42 *	Fishing Boat	Indonesia	Stranding	Nil	Nil	
132	23-Dec-94	07:40	WITA	Pertamina / Waingapu			498	Tanker	Indonesia	Collision to Pier	Nil	Nil	
133 134	31-Dec-94 01-Jan-95	15:00 12:00	WITA WIB	Batanghari River	02-57-00S	118-23-00	172 6	Cargo Passenger	Indonesia Indonesia	Sunken Fallen to sea	Nil 1	303 Nil	Die
135	04-Jan-95	09:15	WIB	Jawa Sea, about 20NM to south from Simedang Is.			398	Cargo	Indonesia	Sunken	9	378	
136	06-Jan-95	00:30	WIB	South of Samai Is	01-08-50N	104-09-25	64 63	Cargo Tug Boat	Indonesia Indonesia	Stranding	Nil	60 Nil	Sunkon
137	07-Jan-95 08-Jan-95	07:00	WIB	South of Salilar Is.	05-22-30S	107-56-00	321	Cargo	Indonesia	Sunken	Nil	399	Sunken
139	14-Jan-95	10:00	WIB	North Coast of Sampit Strait / 70			No Data	Fishing Boat	Indonesia	Sunken	Nil	Nil	
140 141	14-Jan-95 15-Jan-95	17:00 17:00	WIB WIB	NM to north from Bawean Is.			80 140	Cargo	Indonesia Indonesia	Sunken	Nil Nil	90 * 70	
142	15-Jan-95	09:00	WITA	among Lapang Is., Pantar Is. & Tg.			No Data	Cargo	Indonesia	Sunken	Nil	5 *	
143	17-Jan-95	08:30		near No.1 Buoy of	07-58-00S	118-55-30	173	Cargo	Indonesia Indonesia /	Sunken	Nil	200	
144	19-Jan-95	17:52	WITA	Barito river channel 24 NM off from east			499 / 1,412	Cargo / Tanker	Indonesia	Collision	Nil	Nil	
145	20-Jan-95	11:00	WITA	of Sapudi Is.			7	Cargo	Indonesia Belize /	Sunken	4	Nil	
146	20-Jan-95			Putting North waters of			882	Cargo	Manila	Engine Trouble	Nil	Nil	
147	21-Jan-95	19:00	WIB	Sapudi Is.	04.00.001	100.10.00	165	Cargo	Indonesia	Sunken	Nil	60	
148	22-Jan-95 23-Jan-95	20:35	WIB		01-06-00N 06-20-00S	103-43-00	252	Cargo	Iran Indonesia	Fire	<u>Nil</u>	N11 340	Sunken
150	25-Jan-95	02:00	WITA	Atapupu harbor			No Data	Cargo	Indonesia	Stranding	Nil	Nil	
151	26-Jan-95	03:15	WIB	channel	00-45-00N	104-53-05	2,157	Tanker	Indonesia	Stranding	Nil	Nil	
152	28-Jan-95	15:25	WIB	Kiabu waters of	00-56-20N	104-23-15	53	Passenger	Indonesia	Fire	Nil	Nil	
153	31-Jan-95			Kec. Siantar / Riau Islands			34	No Data	Indonesia	No report	No Data	No Data	
154 155	03-Feb-95 07-Feb-95	10:30 03:00	WITA WIB		01-50-00S 06-38-00S	123-40-40 110-25-00	186 782	Cargo Cargo	Indonesia Indonesia	Fire Sunken	2 Nil	40 700	Sunken
156	10-Feb-95	18:30	WITA	Channel of mouth of			3,256 / 382 /	Cargo / Tug Boat / Tug	Indonesia / Indonesia /	Collision	Nil	Nil	
157	12 Eab 05	00.20	WITA	Barito river	04 20 015	120 25 24	2,288	Boat + Barge	Singapore	Stronding	NH	Nil	
157	12-Feb-95	01:30	WIR	North side of	04-30-015	120-23-24	400	Tug Boat	Indonesia	Sunken	Nil	Nil	
150	12-Feb-95	21:30	WIB	Kalimun Jawa Is. No Data	No Data	No Data	351	Passenger	Indonesia	Fire	Nil	Nil	
160	14-Feb-95	10:00	WIB	North waters of Blimbing villige Kec.			No Data	Fishing Boat	Indonesia	Sunken	Nil	Nil	
161	21-Feb-95	14:40	WITA	3 NM off from south of Kojadoi Is. In Flores Sea			No Data	Passenger	Indonesia	Sunken	1	Nil	
162	25-Feb-95	13:00	WIT		04-10-00S	132-42-00	No Data	Passenger	Indonesia	Engine Trouble and drifting	Nil	Nil	
163	26-Feb-95	17:10	WIB				31		Indonesia Honduras /	Sunken	Nil	Nil	
164	28-Feb-95	06:56	WIB	Sunda Kelapa Port			499 / 471	Cargo / Cargo	Indonesia	Collision	Nil / Nil	Nil / Nil	
165	04-Mar-95	00:50	WITA	27 NM off couth of	05-39-00S	121-06-00	87 / 634	Tug Boat / Barge	Indonesia	fallen to sea	Nil / Nil	/ 963	
166	05-Mar-95	08:30		Manggarai of Tg. Flesko/ Maluk Sea			87	Fishing Boat	Indonesia	Sunken	24	10 8/ NH/	
167	05-Mar-95	21:00	WIT	Merauke Port			11/29/37/35/19	rgo/Cargo/Cargo/Ca	Indonesia	e/Fire	Nil/Nil/Nil	8/ INII/ Nil/7/ Nil	
168	17-Mar-95	20:20	WIB	Quay front of Warehouse 06 at Sunda Kelapa Port			171	Cargo	Indonesia		Nil	239	
169	17-Mar-95	20:30	WIB	Quay front of Warehouse 08-S at Sunda Kalana Bart			171 / 174 / 284	Cargo / Cargo / Cargo	Indonesia / Indonesia /	Fire / Fire / Fire	Nil / Nil / Nil	242 */ 283 */ 151 *	Under mooring
170	20-Mar-95	20:00	WIB	Waters b/w			No Data		Indonesia		5	Nil	Missing
171	21-Mar-95	04:30	WIB	Seliu Is.			186	Cargo	Indonesia	Broken and	Nil	236	
172	21-Mar-95	10:00	WIB	Kec. Lhoknga/	<u> </u>		16	Passenger	Indonesia	Sunken Fire	Nil	Nil	
173	21-Mar-95	04:00	WIB	Leupung B. Aceh Unpan Bay, Tumbang Nusa			232	Passenger	Indonseia	Sunken	10	Nil	
174	99 M 0*	05.00	WID	Villege, Kec. Kohavan Hilir	00 45 100	104 10 40	101	True D	Terday 1	Sum 1	NP	N71	
174	22-Mar-95	22:15	WIB		01-16-305	104-12-40	101	Tug Boat	Indonesia /	Collision	Nil	Nil	Cansized /
176	28-Mar-95	14:39	.,,,,		51 10 503		4,610	Cargo	Panama Panama	Collision to Pier	Nil	Nil	Supsizeu /
177	28-Mar-95	11:30	WIB	Batanghari River,			19/651	Tug Boat / Barge	Indonesia /	Collision to	Nil	Nil	
178	31-Mar-95	15:15	WIB	Pier of Tg. Ungga/			5	Speed Boat	Indonesia	Fire	5	Nil	
179	05-Apr-95	11:25		Kec. Kuala Kampar Pier of Pare-Pare			2,302	Cargo	Indonesia	Accident on the	1	Nil	
180	07-Apr-95	10:00	WITA	Port 2 NM off to east of Buha Villege, Kec.			18	Cargo	Indonesia	deck Fire and Sunken	2	5	
181	10-Apr-95	11:39	WITA	Tagulandang Pomako Wooden			6,041 *	Passenger	Indonesia	Collision to Pier	Nil	Nil	
182	16-Apr-95	13.30	WIR	Pier of TIMIKA North of Sanggar			149	No Data	Indonesia	Fire and Sunker	1	Nil	
104	10 A 07	10.00	WID	Bay Belawan Harbour			140	Tanker / C	Indonesia /	C-lli-i	1	1 N H	
163	10-Apr-95	00:31	WIB	Waters 27 NM off east of			4,029/3,23/	Tanker / Cargo	Indonesia	Comsion	INII	INII	
184	20-Apr-95	03:15	INO Data	Reo. Port Mouth of			415	Cargo	Indonesia	Fire	Nil	410	
185	21-Apr-95	15:00	WITA	Pagurawan river	09-21 005	191 19 00	5 280	Fishing boat	Indonesia	Fallen to sea	1 Nil	Nil	Die
	6 I - AUE-MO	11.00	VVIIA		CUU-12-00	161-16-00	603	i dissenger	U.JA	90100000	1111	1 1111	

No.	Date	Time	Time	Location	Latitude	Longuitud	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading	Remarks
187	22-Apr-95	18:30	WIB	Sebukat Village,		e	7 / 370 *	Cargo / Tug Boat +	Indonesia /	Collision	Nil / Nil	Loss (10n) Nil / Nil	
101	22 pr 00	10.00		Kec. Kumai Atapupu harbor				Barge	Indonesia				
188	24-Apr-95	21:00	WITA	channel			278	Cargo	Indonesia	Stranding	Nil	Nil	
189	02-May-95 02-May-95	03:15	WIB	Waters of Mata			34 107 *	Fishing Boat	Indonesia	No Data	1	Nil	
191	05-May-95	13:44	WITA	Outer Ambang Channel, Barito			6,022 / 264	Passenger / Cargo	Indonesia /	Collision	Nil / Nil	Nil / Nil	
	-			River about 400m to				Fishing boat / Fishing	Indonesia /				
192	06-May-95	23:30	WIB	center from Water	07.00.007	100 11 00	5*/3*	Boat	Indonesia	Collision	Nil / Nil	Nil / Nil	
193 194	08-May-95 09-May-95	01:00	WITA No Data		05-06-00S 09-21-00S	120-41-00 121-12-00	380	Tug Boat / Barge Cargo	Indonesia Indonesia	Flooding	Nil	20 Nil	
195	15-May-95	11:03	WIB	East Coast of Mumatera			424	Cargo	Honduras	Sunken	Nil	408	
196	18-May-95	02:30	WIB	Pier of Tlk. Nibung			96	Cargo	Indonesia Indonesia / No	Fire	1 2 injuny/ No	Nil 18 Mahilas /	/ Hit and
197	19-May-95	21:31	WIB		05-55-02S	105-56-64	4564 / No Data	Passenger / No Data	Data	Collision	Data	No Data	run
198	23-May-95				02-56-00N	096-34-30	343	Tug Boat	Indonesia	Hydraulic System Trouble	Nil	Nil	
199	23-May-95	17:18	WIT	Ternate Port			1,405 *	Cargo	Indonesia	Collision to Pier	Nil	Nil	
200	28-May-95	05:45	No Data		28-51-50N	120-31-57	Data	Cargo / Fishing Boat	China	Collision	Nil / Nil	Nil / Nil	
201	04-Jun-95	05:30	WIB	Off Tanjung Putting	01 15 20N	104 22 00	161	Cargo Tug Boat + Barge /	Indonesia Singapore /	Fire	4 Nil / 2	Nil / Nil	Sunken
202	03-Juli-93	03.30	WIB	Paniang Strait	01-13-30IN	104-22-00	03+03970	Fishing Boat	Indonesia	Contision	11173	INII / INII	
203	06-Jun-95	06:00	WIB	Channel Waters			1	Speed Boat	Indonesia	Fire	Nil	Nil	
204	08-Jun-95	20:10	WIB	Curve, about 100m north of Log Pound			1 / 1	Speed Boat / Speed Boat	Indonesia / Indonesia	Collision	1 / Nil	Nil / Nil	
205	08-Jun-95	10:00	WIB	about 45 NM off to West side of			78	Cargo	Indonesia	Sunken	3	20	
200	10- Jun 0#	21.00	илр	Bawean Is.	03-02 005	121 12 00	954	Cardo	Indonesia	Fire	Nij	Nil	Sunkon
207	11-Jun-95	03:00	WIB	Air Hitam Strait,	00 02-003	161-16-00	7 / No Data	Cargo / No Data	Indonesia / No	Collision	1 / No Data	Nil / No	Sunken /
<u> </u>	05			Panjang Strait End of east side of			u	Passapron / Fishin-	Data Indonesia /			Data	Hit and
208	12-Jun-95	13:10	WIB	Pier, Jangkar Port Waters			333 / 2	Boat	Indonesia	Collision	Nil / 2	Nil / Nil	
209	17-Jun-95	12:53	WIB	Pier II of Celukan			1,904	Cargo	Indonesia	Collision to Pier	Nil	Nil	
				Bawang, Bali 35 NM South-West				0					
210	18-Jun-95	13:30	WIB	of Rinca Is., Kec. Komodo			173	Cargo	Indonesia	Sunken	17	360	
211	18-Jun-95	03:30	WIT	East side of			16	Fishing Boat	Indonesia	Sunken	8	2	
212	18-Jun-95	03:15	WITA	North Side of Tg.			107	Passenger	Indonesia	Stranding	Nil	Nil	
				Paputungan around				8		8			
213	19-Jun-95	19:30	WIB	Sarbete/Larantuka			174	Cargo	Indonesia	Stranding	Nil	188	
214	20-Jun-95	02:35	WITA	Enert of Conice	01-09-45N	104-11-55	2,574	Passenger	Indonesia	Fire	Nil	Nil	
215	20-Jun-95	20:00	WIT	Port, about 200m			No Data	Cargo	Indonesia	Sunken	17	Nil	
010	00 I 07	10.17	WID	from shore of Palue Batanghari River,			0.17		T 1 .		N.11	211	
216	26-Jun-95 29-Jun-95	12:15	WIB	Jambi	03-42-225	107-17-42	647 357	Cargo	Indonesia	Flooding	Nil	N11 756	
218	29-Jun-95	06:00	WITA	Indonesia Ocean	00 12 220	101 11 18	96	Fishing Boat	Indonesia	Sunken	Nil	Nil	
219	29- Jun-95	03.00	WITA	waters about 50 NM to			125	Cargo	Indonesia	Sunken	Nil	100	
220	30-Jun-95	No Data	No Data	West side of Bakau River sea			123	Cargo	Indonesia	Stranding	Nil	Nil	
221	01-Jul-95	05:00	WIB		01-55-00S	106-16-30	269 / 1,459	Tug Boat / Barge	Honduras /	Touching to draft	Nil / 1	Nil / Nil	
222	01-Jul-95	00:30	WITA	East side of			172	Cargo	Indonesia	Sunken	8	300 *	
999	06 101 05	No Doto	No Doto	Mempango Sandbar Tanjung Batu			207	Canda	Indonesia	Stronding	Nil	646	Sumkon
223	10-Jul-95	02:00	WIB	Tokong Waters Tumbilahan Port			170	Cargo	Indonesia	Sunken	Nil	040 Nil	Sunken
995	14 Jul 05	20.26	WID	Kembang Merah			24,945 */ 30,850	Topken / Topken	Indonesia /	Colligion	Nil	Nil	
223	14-Jul-93	20.20	WID	Musi river			*	Talikei / Talikei	Indonesia	Contision	INI	INII	
226	17-Jul-95	05:30	WIB	West side of Tg.	00-53-00S	105-41-00	128	Cargo	Indonesia	Sunken	Nil	180	
227	18-Jul-95	14:00	WIB	Putting, Central Kalimantan			25	Fishing Boat	Indonesia	Sunken	Nil	Nil	
228	20-Jul-95	18:55	WIB	about 45 NM +			87	Passenger	Indonesia	Stranding	Nil	Nil	
229	23-Jul-95	09:20	WIB	off Karimun Jawa			119	Sailing Boat	Indonesia	Sunken	12	Nil	
230	24-Jul-95	04:00	WITA	Sanggar Strait Waters			7	Passenger	Indonesia	Fallen to sea	1	Nil	Missing
231	25-Jul-95	19:39	WIB	Pier of Tg. Uban			8,890 *	Tanker	Indonesia	Touching to KRI Multatuli	Nil	Nil	
232	26-Jul-95	23:30	WIB			1	69	Cargo	Indonesia	Sunken	Nil	40	112.
233	29-Jul-95	02:20	WIB	East side of Gersik			No Data / 270	No Data / cargo	No Data /	Collision	No Data /	No Data /	Hit and Run /
				is. about 3NM b/w Tø.					muonesia		INII	006	Sunken
234	31-Jul-95	04:30	WITA	Semisir & Sekateng			108	Cargo	Indonesia	Fire	Nil	120	Sunken
235	04-A119-95	03:00	WIR	Pier of Wainganu			33	No Data	Indonesia	Fire	Nil	Nil	Ship not
990	12 Aug 05	00.20	WID	Pier of Pg. Terak,			No Dot-	Speed De-+	Indone-!-	Sumker-	11	NI	registered
230	12-Aug-95	19.00	WITA	Surabaya			138	Speeu Doat	Indonesia	Sunken	Nil	200	
238	13-Aug-95	07:45	WITA	about 5NM from			13	Speed Boat	Indonesia	Capsized	14	Nil	
230	14-Aug 0#	21.15	WIR	Padangbai, Bali Batanghari River,			6/9	Cargo & Passenger /	Indonesia /	Collision	Nil / Nil	Nil / 9	
6.15	17 Aug-93		WID	Rukan Village, West of Bintunan			010	Cargo & Passenger	Indonesia	Compion			
240	15-Aug-95	09:20	WIB I T	Village	01-10.005	108 10 00	3,943	Cargo	Indonesia	Sunker	Nil	N11 300	
241	20-Aug-95	02:00	WITA	Makassar Strait	01-10-005	100-10-00	37	Cargo	Indonesia	Sunken	Nil	12 *	
243	24-Aug-95	03:20	WITA	South-west of Batubara Is.			116	Cargo	Indonesia	Sunken	Nil	100	
244 245	26-Aug-95 27-Aug-95	01:30 09:30	WIB		05-33-06S 00-12-50S	104-13-05	3,926 70 / 446	Cargo Tug Boat & Barge	Indonesia Indonesia	Sunken Stranding	Nil Nil	6,300 Nil	
246	27-Aug-95	No Data	No Data		10-28-30S	122-40-30	6	Cargo	Indonesia	Sunken	Nil	30 *	

No.	Date	Time	Time	Location	Latitude	Longuitud	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading	Remarks
	Dute	1	Zone	North side of	Lutitude	е		Tiniu or Ship	1 mg		Victimo	Loss (Ton)	
247	28-Aug-95	21:40	WIB	Lateral Mark (Red)			375	Cargo (LST Type)	Indonesia	Sunken	11	150	
				of Prapat Agun				g- (),F-)					
248	03-Sep-95	21:12	WIB	Ginnanuk	02-05-45S	105-05-75	49,342 *	Passenger	Indonesia	Stranding	Nil	Nil	
				North side waters					Indonesia /				
249	03-Sep-95	02:15	WIB	East of Kota			175 / 85	Cargo and Cargo	Indonesia	Collision	Nil / Nil	Nil / 80	/ Sunken
				Buleleng, Bali Muara Pegah									
250	05-Sep-95	06:30	WIT	Channel b/w No.3			499 / 12	Cargo / Cargo	Honduras /	Collision	Nil / Nil	Nil / Nil	
951	10 5 05	01.00	MUTTA	Buov & No. 5 Buov			007	N- D-t-	Indonesia	Eine	NH	NH	
201	10-Sep-95	01.00	WIIA	Pier of PT. Benua			221	No Data	indonesia	File	INII	INII	
252	17-Sep-95	05:25	WITA	Multi Lestari,			677	Tanker	Indonesia	Fire	1	Nil	Sunken
				b/w Wawonii Is.									
253	17-Sep-95	02:00	WITA	Waters and Shore			169	Passenger	Indonesia	Stranding	Nil	Nil	
254	23-Sep-95	19:30	WIB	of Sulawesi Is.	01-06-08S	103-42-93	62	Cargo	Greek	Stranding	Nil	Nil	
255	30-Sep-95	21:30	WIB				No Data / 174	No Data / cargo	No Data /	Collision	1 / Nil	Nil / 280	
256	01-Oct-95	No Data	No Data				40 *	Passenger	Indonesia	Stranding	Nil	Nil	
257	02-Oct-95	20:00	WITA				295	Cargo	Indonesia	Sunken	Nil	600	
258	04-Oct-95	No Data	No Data				78 / 568	Tug Boat / Barge	Singapore	Stranding / No	Nil / Nil	Nil / Nil	
259	10-Oct-95	03:20	WITA	Dian of Wannali			154	Passenger	Indonesia	Sunken	Nil	Nil	
260	12-Oct-95	07:48	WITA	Kisar			662	Cargo & Passenger	Indonesia	Collision to Pier	Nil	Nil	
0.01	91 0-2 07	00.10	WID	Keladi Strait,			150 .1 441 / 100	Tug Boat + Barge /	Indonesia+Sin	Stranding	N721	NT21	
261	21-Oct-95	00:10	WIB	Batanghari River, Jambi			100 +1,441 / 173	Cargo	gapore / Indonesia	+Collision /Collision	INII	INII	
262	22-Oct-95	18:30	WIB	Waters of port of			173	Cargo	Indonesia	Fire	Nil	Nil	
\vdash				Belakang Is. Waters of about	<u> </u>			U			<u> </u>		
263	25-Oct-95	14:45	WIB	100NM from			21	Fishing Boat	Indonesia	Fire	Nil	Nil	
<u> </u>				Meulaboh Port Pier of of	-						-		
264	26-Oct-95	04:35	WIB	Plengsengan Ujung,			270	Passenger	Indonesia	Sunken	Nil	200	Under Loading
265	28-Oct-95	23:30	WIB	Surabaya Pier of Merauke			3,555	Ferry/Passenger	Indonesia	Collision to Pier	Nil	Nil	s
266	29-Oct-95	11:00	WIB	Cerita Coast			1 / No Data	Passenger / No Data	Indonesia / No	Collision	Nil / No	Nil / No	
0.07				Waters Waters of Halang					Data		Data	Data	
267	02-Nov-95	03:00	WIB	Belakang Is.			5	Fishing Boat	Indonesia	Fallen to sea	1	Nil	
268	03-Nov-95	10:15	WIB	Waters b/w Jemur Is. & Pandan Is.			1,592	Cargo	Indonesia	Fire	Nil	2,340	Sunken
269	24-Nov-95	20:00	WIB	Waters of Penjalin			33	Fishing Boat	Indonesia	Sunken	1	Nil	
				Is., Kec. Sianian Waters of Sugi					_				
270	01-Dec-95	14:45	WIB	Bawah Is., Kec.			29	Tug Boat	Panama	Sunken	Nil	Nil	
271	01-Dec-95	00:45	WIB		00-39-50N	103-41-30	877 / No Data	Cargo / No Data	Indonesia / No Data	Collision	Nil / No Data	Nil / No Data	/ Hit and
272	04-Dec-95	19:30	LT		06-08-53S	108-25-91	910	Tanker	Singapore	Sunken	Nil	1,700	Crude Oil
273 274	06-Dec-95 07-Dec-95	18:00 13:10	WIB		02-52-00S 05-43-30S	107-18-00	494 143	Cargo Barge	Indonesia Indonesia	Sunken Sunken	Nil Nil	424 Nil	
275	07-Dec-95	07:10	WITA		03-46-03S	114-30-05	250	Tug Boat	Singapore	Flooding	Nil	Nil	
276	07-Dec-95	05:00	WITA	Waters of Lampui Bay Sumbawa Is			56 + 2,224	Tug Boat + Barge	Panama + Singapore	Stranding (Barge	Nil	Nil	
277	08-Dec-95	23:15	WIB	Day, Sumbawa 13.	06-27-06S	113-47-06	726	Cargo	Indonesia	Flooding	7	Nil	Stranding
278	11-Dec-95	14:00	WITA	Bone Bay b/w Lasusua and Siwa			34	Passenger	Indonesia	Sunken	64	20	
279	11-Dec-95	15:00	WITA	Bone Bay around			45	No Data	Indonesia	Sunken	Nil	6	
2.10	II Dec 00	10.00		######## Waters besides			10	no butu	muonesiu	Buinten		Ŭ	
280	13-Dec-95	09:00	WIB	Belitung Is.			57 + 307	Tug Boat + Barge	Indonesia	Sunken	Nil	Nil	
281	17-Dec-95			Waters of Kenalah	02-43-00S	122-41-00	488	Cargo	Indonesia	Sunken	Nil	750	
282	20-Dec-95	10:00	WIB	Jerih Is.			909	Cargo	Indonesia	Sunken	Nil	937	
283	20-Dec-95	19:45	WIB	Waters of West			34	Cargo	Indonesia	Sunken	Nil	25	
284	27-Dec-95	02:00	WIB	Kalimantan			171	Cargo	Indonesia	Sunken	Nil	20	
285	28-Dec-95	01:30	WIT	117 A 117 -			6	Cargo and Passenger	Indonesia	Sunken	24	2	Hit and
286	29-Dec-95	02:00	WIB	Waters of Biawak Is., Indramavu			No Data	Fishing Boat	Indonesia	Sunken	2	Nil	run by No
0		00.77		Waters of Sebangau							-		Data ship
287	02-Jan-96	02:00	WIB	Bay			110	LST	Indonesia	Capsized	2	60	Sunken
288	02-Jan-96	15:40	WITA	Break water Channel. Uiung			3,256	Cargo	Indonesia	Collision to Pier	Nil	Nil	
				Pandang				U					
289	03-Jan-96	21:10	WIB				3,473 / 1,178	Cargo / Tanker	Indonesia / Indonesia	Collision	Nil / Nil	Nil / Nil	
290	10-Jan-96	01:00	WITA	Brench CH			198	Cargo and Passenger	Indonesia	Stranding	Nil	3	
291	13-Jan-96	16:30	WIB	Drancn of Kateman Pile acreage of	<u> </u>		No Data	Passenger	Indonesia	Sunken	3	NII	
292	10 Jan-96	02:30	WIB	Sapudi Port	OF 40 COT-	005 08 05	208	Filing Boat	Indonesia	Comsion to Piles	NII	IN11 70	
293	19-Jan-96	20:40	WIB	Waters of South of	05-46-30N	095-22-25	190	Passenger	Indonesia	Sunken	338	78	
294	∠1-Jan-96	07:00	WITA	Tg. Putting			47	INO Data	Idonesia	Sunken	INII	INII	
	or 7 00	10.05		PT. Indah Kiat			1.071/070/70	Tanker / Cargo / Tug	Indonesia /	G 114 4			
295	25-Jan-96	13:35	WIB	Perawang, Siak			1,374 / 956 / 58	Boat	Indonesia / Canbodia	Collision	Nil	Nil	
<u> </u>				River about 40 NM from	-	-					-		
296	28-Jan-96	14:00	WIB	Jawana, east sea of			123	Cargo	Indonesia	Sunken	1	80 *	
<i>c</i> :	aa - 1			Tg. Mandalika 20 NM to east from	-	-		· -					
297	09-Feb-96	14:00	WIT	Selayar Is.			No Data	No Data	Indonesia	Sunken	Nil	160	
298	10-Feb-96	20:54	WIB	Nusantara Pier, Baai Port			970	Cargo	Indonesia	Collision to Dolphin	Nil	Nil	
299	17-Feb-96	01:00	WIB	Tanjung Torobeang,			172	Cargo	Indonesia	Stranding	Nil	150	
				Flores Sea Coast of Pacat Bav.									
300	1	07.00	WID		1								
	02-Mar-96	07:00	WID	about 10NM from			5	Cargo	Indonesia	Sunken	1	Nil	
<i>c</i> -	02-Mar-96	07:00	WIB	about 10NM from Kendawangan Port East side of Pier at			5	Cargo	Indonesia /	Sunken	1	Nil	

No.	Date	Time	Time	Location	Latitude	Longuitud	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading	Remarks
302	08-Dec-96	01:45	WIB	Seraya Besar Strait, Pasir Putih Village, Kec.		e	6	Cargo	Indonesia	Sunken	Nil	30	
303	08-Dec-96	01:45	WIB	Komodo, Kab. No. 302 Quay, Tg. Priok			9,513	Cargo	St. Vincent & the Grenadines	Fire	Nil	Nil	
304	11-Dec-96	06:10	WITA		04-31-32S	115-32-00	35 + 173	Tug Boat + Barge	Indonesia	Engine Trouble + Sunken	Nil +Nil	Nil + 495	
305	12-Dec-96	06:00	WITA		04 01 475	119 54 56	168	Cargo	Indonesia	Engine Trouble	Nil	Nil	
307	22-Dec-96	03:00	LT		05-08-13S	119-23-04	1,549	Cargo	Panama	Flooding / Stranding /	Nil	Nil	
308	22-Dec-96	05:40	WIB				34 + 986	Tug Boat + Barge	Indonesia	Sunken +	1 + Nil	Nil + Nil	
309	24-Dec-96	16:55	WIB	Unkown			190 / 177 / 2,374	Tug Boat / Tug Boat / Barge	Singapoer / Singapore /	-/-/Collision to Dolphine of Pier,	Nil/Nil/Nil	Nil/Nil/Nil	
310	29-Dec-96	09:29	WIB	2NM to south from			34	Passenger	Indonesia	Sunken	Nil	Nil	
311	04-Jan-97	05:30	WIB	Pier of Tg. Pandan			405	Cargo	Indonesia	Fire	Nil	238	
312	05-Jan-97	19:23	WIB	Port	03-33-55S	114-28-07	6,022	Passenger	Indonesia	Stranding	Nil	Nil	
313	15-Jan-97	10:45	WITA	Cargo Pier of Benoa	08-22-00S	122-58-08	6,000	Passenger	Indonesia	Diving to sea Worker struck	1	Nil	
314	16-Jan-97	10:20	WIB	Port, Bali			1,487	Cargo	Indonesia	down by	1	Nil	
315	20-Jan-97	11:10	WITA	to Pertamina Atapupu Port	05 10 050	110.00.00	1,536	Tanker	Indonesia	Collision to Light Beacon	Nil	Nil	
316	28-Jan-97 29-Jan-97	01:10	WIB	around Bawean Is.	05-49-05S 05-13-03S	113-23-06	$\frac{4,119}{93+1,000}$	Tug Boat + Barge	Indonesia	- / Sunken	Nil + Nil	2,000 Nil + 1,287	
318	01-Feb-97	23:30	WIB	I arantuka Bart	00-00-13S	109-19-44	5,938	Cargo	Indonesia	Fire	Nil	Nil	Sunkon
329	07-Feb 07	00:30	WITA				76/83/Nil/Nil/Nil	Cargo/////Cargo	Indonesia	Fire	Nil	Nil	Sunken
320	07-Feb-97	01.07	WIIA		05 00 005	100 ** **	/15/206	Cargo //// Cargo	Indonesia /	rire	INII NII (SIII	INII NUL (FOI	(6.)
321	15-Feb-97	01-27	WIB WITA		05-26-30S	106-41-40	884 / 115	Cargo / Cargo Fishing Roat	Indonesia	Collision	Níl / Níl Níl	Nil / 501	/ Sunken
323	17-Feb-97	19:23	WIB	Surabaya Port	10-45-505	100-41-40	20,945	Cargo	Indonesia	Collision to Pillot	Nil	Nil	
324	19-Feb-97	18:00	WIB	Merak Waters of south side of Merak			5,543	Ocean Going	Indonesia	Fire	Nil	Nil	
325	19-Feb-97	10:30	WIB	Kecil Is.	00-55-40N	104-25-40	18		Indonesia	Sunken	1	2	
326	22-Feb-97	03:00	WITA	North of To Dujut	01-15-46	116-56-07	34 No Data / No	Cargo	Indonesia Indonesia /	Capsized	1 Nil / Nil	Nil / 2,400	Sunken
327	24-FeD-97	12:45	WIB	North of 1g. Pujut Jawa Sea, about 30	05-52-105	106-02-10	Data	Tug Boat / Barge	Singapore	- / Sunken	N11 / N11	KL	
328	05-Mar-97	02:30	WIB	NM to south from Masalembo Is.	12 20 005	114 42 00	643	Cargo	Indonesia	Sunken	21	1,000	
329	28-Mar-97	07.15	WIR		12-30-003	114-43-00	33 1 595 / 5 837 *	Tuker / Ferry	Indonesia /	Collision	Nil / Nil	Nil / Nil	
331	30-Mar-97	21:00	WITA		05-20-00S	121-11-00	340	Cargo	Indonesia Indonesia	Sunken	Nil	117 *	
332	09-Apr-97	17:30	WITA		10-12-00S	123-31-30	634	Passenger	Indonesia	Propeller broken by hard rock	Nil	Nil	
333	15-Apr-97	22:30	WITA	Tg Binong	08-24-30S	122-16-40	171	Cargo	Indonesia	Fallen to sea	1	Nil	Captain
334	20-Apr-97	03-30	WIB	Jakunyir river			16 / 17	Boat	Indonesia	Collision	1 / Nil	Nil / Nil	
335	24-Apr-97	09:30	WIB	Pier of ###_North of	00-53-00N	103-07-10	34	Cargo	Indonesia	Stranding	Nil	Nil	
336	27-Apr-97	11:00	WIB	Tg. Perak			175	LST	Indonesia	Sunken	2	140	
337	11-May-97	14:00	WITA	Entrance of Tg. Lumpur river,			79	Cargo	Indonesia Indonesia /	Stranding	Nil	Nil	
338	13-May-97	21:00	WIB	Putat river	00.00.001	000 00 15	158	Cargo	Indonesia	Collision	Nil / Nil	Nil Nil	
339	30-May-97	23:30	WIE	South of Light Beacon, Davangdavangan	03-26-00IN	099-39-15	139	Tug Boat	Indonesia	Sunken	Nil	Nil	
341	02-Jun-97	20:00	WIB	Besar Is. Marawang Village, Muda Is., Kec.			4	Speed Boat	Indonesia	Stranding	19	Nil	Sunken
0.10	07.1 07	10.07		Kuala Kampar	00 50 005	107 711-	100 0100		Singapore +	Sunken +	AT11 - 111	A101 A107	
342	07-Jun-97	23.00	WIB		06-50-20S	105-54-10	177 + 2132 901	Tug Boat + Barge	Singapore	Sunken	Nil + Nil Nil	N11 + N11 420	
344	12-Jun-97	23:23	WID	Enter Channel of Lembar Port	04-07-133	107-11-35	676	Cargo	Indonesia	Collision to No.1 Light Beacon (Green), Lembar	2	Nil	
945	14 Jun 07	02.4#	WID		06 59 955	114.95.90	169	Canda	Indone-!-	Port	NI()	NH	
346	15-Jun-97	09:30	WIB	60 NM to south-	00 00-200	114-60-00	331	Cargo	Indonesia	Sunken	4	312	
347	17-Jun-97	06:15	WIB	west from	05-39-00S	116-09-06	49,727	Tanker	Indonesia	Missing, crew	1	Nil	
348	19-Jun-97	10:03	WIB		00-42-55N	108-40-10	1,314 / 5,043	Tanker / Cargo	Panama / Thailand	Collision	Nil / Nil	Nil / Nil	
349	21-Jun-97	04:30	WIT	Karang Conting	03-47-30S	128-00-30	87	Cargo	Indonesia	Sunken	1	Nil	
350	25-Jun-97	09:00	WIB	South-east of Siliu			303	Cargo	Indonesia	Sunken	Nil	Nil	
351	26-Jun-97	20:55	WIB	Jawa sea, near center b/w Sampit & Bawean			494	Cargo	Indonesia	Sunken	Nil	450 *	
352 353	27-Jun-97 30-Jun-97	19:00 09:05	WIB WIB		00-45-45N 00-54-30S	104-22-15 108-52-00	35 1.019	Cargo Cargo	Indonesia Indonesia	Sunken Sunken	Nil Nil	35 1,265 *+3	
354	04-Jul-97	15:05	WITA	North side of Moyo			146	Cargo	Indonesia	Fire	Nil	200	Sunken
355	06-Jul-97	07:40	WITA	is., Sumbawa			395 / No Data / Unnown	- Tug Boat / No Data / No Data	Indonesia / Indonesia /	Collision	Nil / Nil / Nil	Nil / Nil / Nil	
356	12-Jul-97	14:00	WIB		00-58-39N	104-13-39	102	Passenger	Indonesia Indonesia	Sunken	14	Nil	
357	14-Jul-97	00:35	WIB	Tonak waters, Toba lake			19	Passenger	Indonesia	Capsized	83	Nil	
358	17-Jul-97	21:00	WIB	50 NM to east of			190	Cargo	Indonesia	Sunken	Nil	Nil	
359	17-Jul-97	04:43	WITA	Bawean Is. Balikpapan Port	01-16-18S	116-47-46	8,942	Tanker	Singapore	Flooding	Nil	Nil	
360	17-Jul-97	03:00	WITA	Waters of South of Lombok Is.			No Data	Fishing Boat	Indonesia	Sunken	2	Nil	

No.	Date	Time	Time Zone	Location	Latitude	Longuitud e	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
361	19-Jul-97	04:44	WIB	Pier of Peuyaberangan			5,584 / 58	Passenger / Passenger	Indonesia / Indonesia	Collision	Nil / Nil	Nil / Nil	/ Sunken
362	19-Jul-97	17:15	WIB	Port, Bakau neni	06-17-15S	112-43-25	54 + 638	Tug Boat + Barge	Indonesia + Indonesia	- / Sunken	Nil	Nil	
363	20-Jul-97	09:00	WIB		04-50-20S	119-32-22	2	Passenger	Indonesia	Sunken	9	Nil	
364	27-Jul-97	13:40	WIB	Kubang Is., ###########			66 / 7	Ferry & Passenger / Cargo	Indonesia / Indonesia	Collision	Nil / Nil	Nil / 13	
365	27-Jul-97	00:00	WITA	0.9 NM to south from Pegatan Heist			6	cargo	Indonesia	Stranding	Nil	14	
366	29-Jul-97	15:45	WIT		00-45-30N	127-18-40	1,242	Tanker	Singapore	Stranding and crush to mooring post	Nil	Nil	
367	01-Aug-97	17:00	WIB	Tg. Gundulan			111	Cargo	Indonesia	Sunken	Nil	103 *	
368	02-Aug-97	16:00	WIB	& No.2, Channel of mouth of Kahayan			208	Cargo	Indonesia	Fire	Nil	104	
369	06-Aug-97	13:00	WIB	river	01-00-50N	104-13-45	46	Passenger	Indonesia	Stranding	Nil	Nil	
370	08-Aug-97	00:35	WIB	Jawa Sea, about 9 NM from Tg. ###			57 + 77	Tug Boat + Barge	Indonesia + Indonesia	/ Sunken	Nil + Nil	Nil + Nil	
371	08-Aug-97	21:35	WIB	Lombok Strait.	05-52-47S	105-21-87	3,803	Cargo	Indonesia	Sunken	Nil	5,755 *	
372	09-Aug-97	03:00	WITA	about 10 NM to West from Lembar			206	Cargo	Indonesia	Sunken	Nil	401 *	
373 374	14-Aug-97 16-Aug-97	07:00 19:30	WIB		06-35-30S	105-30-29	6	Fishing Boat Small motorized boat	Indonesia No Data	Sunken Sunken	9 15	Nil Nil	
375	18-Aug-97	19:30	WITA		04-12-00S	115-46-08	1042 / No Data	Cargo / Fishing Boat	Indonesia / No Data	Collision	Nil / Nil	Nil / Nil	
376	19-Aug-97	01:30	WIB	Outer ###, Cilacap			6,133 / 269	Tanker / Tug Boat	Indonesia /	Collision	Nil / Nil	Nil / Nil	
377	21-Aug-97	08:04	WIB		00-53-15S	104-23-35	626	Cargo	Indonesia Indonesia	Sunken	5	400	
378	21-Aug-97	10:30	WIB	Tahawa Aleu Village, Kahayan Port, Kec., Bukit			1	Pedalaman	Indonesia	Sunken	3	Nil	
379	27-Aug-97	No Data	No Data	Cirebon port channel waters			2	Fishing Boat	Indonesia	Sunken	1	Nil	
380	27-Aug-97	01:30	WIB	Merak Port, Out			2,773 / 5	Passenger / Cargo	Indonesia /	Collision	Nil / Nil	Nil / 10	
381	31-Aug-97	02:00	WIB	Channer			90 / No Data	Fishing Boat / No	Indonesia / No	Collision	Nil	Nil	/ Hit and
382	01-Sep-97	12:45	WIB		00-52-31N	103-15-55	138	Data Barge	Data Indonesia	Sunken	Nil	Nil	run
383	05-Sep-97	16:30	WIB		01-07-50N	102-09-30	742	Barge	Indonesia	Collision to Buoy	Nil	Nil	
384	06-Sep-97	05:43	No Data	Pier of Unloading Stand of Pertamina,			4,688	Tanker	Singapore	Collision to Pier	Nil	Nil	
385	09-Sep-97	19:30	WITA	Kotabaru	04-55-40S	122-44-08	6 / No Data	Cargo / Motor Boat	Indonesia /	Collision	Nil / 1	Nil / Nil	/ Sunken
386	15-Sep-97	01.30	WIR	Bay b/w Tg. Tuing			81+1 271	Tug Boat + Barge	Indonesia +	Stranding + -	Nil + Nil	Nil + Nil	
387	16-Sep-97	05:30	WIB	and Mouth of	01-01-00S	104-32-01	224	Cargo	Singapore Indonesia	Sunken	Nil	542 *	
	10.0 07	00.00							Sindonono				
388	16-Sep-97	20:00	WITA		03-16-25S	116-06-07	177 + 3,148	Tug Boat + Barge	Singapore +	/ Stranding	Nil + Nil	Nil + Nil	
388 389	16-Sep-97 16-Sep-97	13:26	WITA	C Disc of Designed	03-16-25S 02-07-25S	116-06-07 139-21-00	177+ 3,148 3,619	Tug Boat + Barge Cargo	Singapore Indonesia	/ Stranding Sunken	Nil + Nil Nil	Nil + Nil 5,328 *	
388 389 390	16-Sep-97 16-Sep-97 16-Sep-97	20:00 13:26 18:30	WITA WIT WIB	C Pier of Panjang Port	03-16-25S 02-07-25S	116-06-07 139-21-00	177+ 3,148 3,619 424	Tug Boat + Barge Cargo Cargo	Singapore Singapore Indonesia Indonesia	/ Stranding Sunken Fire	Nil + Nil Nil Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97	20:00 13:26 18:30 20:07	WITA WIT WIB WITA	C Pier of Panjang Port No. IV Pier of Tg.	03-16-25S 02-07-25S 00-05-22N	116-06-07 139-21-00 109-06-22	177+ 3,148 3,619 424 3,255	Tug Boat + Barge Cargo Cargo Cargo	Singapore + Singapore Indonesia Indonesia Singapore +	/ Stranding Sunken Fire Stranding	Nil + Nil Nil Nil Nil	Nil + Nil 5,328 * Nil Nil	Sunken
388 389 390 391 392 393	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21 Sep 97	20:00 13:26 18:30 20:07 07:00	WITA WIT WIB WITA WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap	03-16-25S 02-07-25S 00-05-22N	116-06-07 139-21-00 109-06-22	177+ 3,148 3,619 424 3,255 190 + 2,374 50	Tug Boat + Barge Cargo Cargo Cargo Tug Boat + Barge Tug Boat	Singapore + Singapore Indonesia Indonesia Singapore + Singapore + Singapore	/ Stranding Sunken Fire Stranding / Collision to Pier	Nil + Nil Nil Nil Nil + Nil Nil + Nil	Nil + Nil 5,328 * Nil Nil Nil + Nil	Sunken
388 389 390 391 392 393 394	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00	WITA WIT WIB WITA WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap	03-16-25S 02-07-25S 00-05-22N 00-48-39N	116-06-07 139-21-00 109-06-22 104-36-06	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo	Singapore Indonesia Indonesia Singapore + Singapore Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken	Nil + Nil Nil Nil Nil + Nil Nil + Nil Nil	Nil + Nil 5,328 * Nil Nil Nil + Nil Nil 40	Sunken
388 389 390 391 392 393 394 395	16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 19-Sep-97 22-Sep-97 22-Sep-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00	WITA WIT WIB WITA WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River	03-16-25S 02-07-25S 00-05-22N 00-48-39N	116-06-07 139-21-00 109-06-22 104-36-06	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 34	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo	Singapore + Singapore - Indonesia Indonesia Singapore + Singapore - Indonesia Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding	Nil + Nil Nil Nil Nil + Nil Nil + Nil Nil Nil	Nil + Nil 5,328 * Nil Nil Nil + Nil Nil 40 Nil	Sunken
388 389 390 391 392 393 394 395 396	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00	WITA WIT WIB WITA WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy	03-16-25S 02-07-25S 00-05-22N 00-48-39N	116-06-07 139-21-00 109-06-22 104-36-06	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 34 223	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo	Singapore Singapore Indonesia Indonesia Singapore + Singapore Indonesia Indonesia Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Sunken	Nil + Nil Nil Nil Nil + Nil Nil Nil Nil Nil	Nil + Nil 5,328 * Nil Nil Nil + Nil Nil 40 Nil 555	Sunken
388 389 390 391 392 393 394 395 396 397	16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55	WITA WIT WIB WITA WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy	03-16-25S 02-07-25S 00-05-22N 00-48-39N 00-48-39N 01-10-58N	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 34 223 303 / No Data	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data	Singapore <u>Singapore</u> <u>Indonesia</u> <u>Indonesia</u> <u>Singapore</u> <u>Indonesia</u> <u>Indonesia</u> <u>Indonesia</u> <u>Indonesia</u> <u>Indonesia</u>	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Sunken Collision	Nil + Nil Nil Nil Nil + Nil Nil Nil Nil Nil Nil Nil	Nil + Nil 5,328 * Nil Nil Nil Nil 40 Nil 555 Nil / Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35	WITA WIT WIB WITA WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy	03-16-255 02-07-255 00-05-22N 00-48-39N 00-48-39N 01-10-58N 05-23-53N	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 34 223 303 / No Data 99 / 291	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge	Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Stranding Sunken Collision - + Sunken	Nil + Nil Nil Nil Nil + Nil	Nil + Nil 5,328 * Nil Nil Nil + Nil 40 Nil 555 Nil / Nil Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg, Intan Port, Cilacap Mouth of Segintung River ####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 34 223 303 / No Data 99 / 291 209	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Stranding Collision - + Sunken Fire	Nil + Nil	Nil + Nil 5,328 * Nil Nil Nil + Nil 40 Nil 555 Nil / Nil Nil Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 400	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Je Muet	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 34 223 303 / No Data 99 / 291 209 3,348 / No Data	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo	Singapore Singapore Indonesia Indonesia Singapore + Singapore + Singapore + Singapore + Indonesia Indonesia Indonesia / Israel Indonesia + Indonesia + Indonesia + Belize / No Data	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Sunken Collision - + Sunken Fire Collision	Nil + Nil Nil Nil Nil + Nil	Nil + Nil 5,328 * Nil Nil + Nil Nil + Nil Nil S555 Nil / Nil Nil Nil Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 07:29	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River ####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 04-40-005	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 112-50-00	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo Cargo	Singapore Singapore Indonesia Indonesia Singapore + Singapore + Singapore + Singapore + Indonesia Indonesia Indonesia / Israel Indonesia + Indonesia + Indonesia + Belize / No Data Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Sunken Collision - + Sunken Fire Collision Fallen to sea	Nil + Nil Nil Nil Nil + Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	Nil + Nil 5,328 * Nil Nil + Nil Nil + Nil Nil S555 Nil / Nil Nil Nil Nil Nil Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 03-Oct-97 03-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River ####, Muara Sabk b/w No.1 Buoy & No.2 Buoy No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 04-40-005 11-15-005	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 02	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat	Singapore Singapore Indonesia Indonesia Singapore + Singapore + Singapore + Singapore + Indonesia Indonesia / Israel Indonesia + Indonesia + Indonesia + Belize / No Data Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Sunken Collision - + Sunken Fire Collision Fallen to sea Fire Fallon to sea	Nil + Nil Nil Nil Nil + Nil	Nil + Nil 5,328 * Nil Nil + Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 404	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97 03-Oct-97 13-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB UT WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No. 1 Buoy & No. 2 Buoy No. 2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of Pekalongan	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 04-40-00S 11-15-00S 07-44-155	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 115-30-10	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Cargo	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble	Nil + Nil	Nil + Nil 5,328 * Nil Nil Nil Nil Nil Nil S55 Nil / Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405	16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97 03-Oct-97 13-Oct-97 21-Oct-97 21-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 02:00 05:15 07:05	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River ####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of Pekalongan	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 04-40-00S 11-15-00S 07-44-15S 02-11-58S	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Cargo Cargo / Tanker	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision	Nil + Nil	Nil + Nil 5,328 * Nil Nil Nil Nil Nil Nil Nil S55 Nil / Nil	Sunken
388 389 390 391 392 393 394 395 397 398 399 400 401 402 403 404 405 406	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97 13-Oct-97 21-Oct-97 21-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15 07:05 01:40	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB UT WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of PKI Pier of PKI Pier of PKI Pier of PKI Pier of Amutu Beasar Is.	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 04-40-00S 11-15-00S 07-44-15S 02-11-58S	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Cargo Cargo / Tanker	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Singapore + Singapore + Sing	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Sunken Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolobine	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97 03-Oct-97 21-Oct-97 23-Oct-97 23-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 02:00 05:15 07:05 01:40 01:30	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB UIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of Pekalongan Amutu Beasar Is.	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 04-40-005 11-15-005 07-44-155 02-11-58S 01-07-50N	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat + Barge Cargo Cargo Cargo Cargo Cargo Cargo Cargo Cargo / No Data Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia + Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Sunken Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 408	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97 03-Oct-97 13-Oct-97 21-Oct-97 23-Oct-97 02-Nov-97 02-Nov-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15 07:05 01:40 01:30 04:10	WITA WITA WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of Pekalongan Amutu Beasar Is.	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 04-40-00S 11-15-00S 07-44-15S 02-11-58S 01-07-50N 01-02-36S	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 104-36-06 104-36-06 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33 100-22-36	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Cargo Cargo Cargo / No Data Tug Boat + Barge Cargo Cargo / No Data Fishing Boat Fishing Boat Cargo Cargo / Tug Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo / Tug Boat + Barge Cargo / Tug Boat + Barge	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia	 / Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Stranding Sunken Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision Stranding 	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 01-Oct-97 02-Oct-97 13-Oct-97 21-Oct-97 23-Oct-97 23-Oct-97 23-Oct-97 23-Oct-97 20-Nov-97 20-Nov-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15 07:05 01:40 01:30 04:10 14:04	WITA WITA WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of PKI Pier of PKI Pier of PKI Pier of Amutu Beasar Is.	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 01-10-58N 05-23-53N 04-40-00S 11-15-00S 07-44-15S 02-11-58S 01-07-50N 01-02-36S 10-37-11S	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 104-36-06 104-36-06 104-36-06 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33 100-22-36 117-17-54	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501 6,022 / 3,936	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo / Tanker Tug Boat + Barge Cargo / Tug Boat + Barge Passenger Passenger / Cargo	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 403	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 02-Oct-97 02-Oct-97 13-Oct-97 21-Oct-97 23-Oct-97 23-Oct-97 23-Oct-97 12-Dec-97 12-Dec-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15 07:05 01:40 01:30 04:10 14:04 02:00	WITA WITA WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of PKI Pier of PKI Pier of PKI Pier of PKI Pier of Amutu Beasar Is.	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 05-23-53N 01-10-50N 07-44-15S 02-11-58S 01-07-50N 01-02-36S 10-37-11S 03-30-00N	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 104-36-06 104-36-06 104-36-06 104-36-06 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33 100-22-36 117-17-54 107-10-00	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501 6,022 / 3,936 171	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge Cargo / Tanker Tug Boat + Cargo	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision Stranding Collision	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391 392 393 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 411	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 22-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 01-Oct-97 02-Oct-97 13-Oct-97 21-Oct-97 23-Oct-97 23-Oct-97 12-Oct-97 13-Oct-97 13-Oct-97 13-Oct-97 13-Oct-97 12-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15 07:05 01:40 01:30 04:10 14:04 02:00 No data	WITA WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is., Musi PKI Pier of Pekalongan Amutu Beasar Is.	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 05-23-53N 01-10-58N 01-10-58N 02-11-58S 01-07-50N 01-02-36S 10-37-11S 03-30-00N No data	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33 100-22-36 117-17-54 107-10-00 No data	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501 6,022 / 3,936 171 No Data	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Fishing Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo / Tanker Tug Boat + Barge Cargo / Tug Boat + Barge Passenger Passenger / Cargo Cargo Fishing Boat	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Indonesia Indonesia Indonesia / Israel Indonesia / Indonesia / In	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision Collision Collision Collision Collision Collision Collision Collision Stranding Collision Stranding Collision	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
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388 389 389 390 391 392 393 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 01-Oct-97 02-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 02-Nov-97 20-Nov-97 12-Dec-97 05-Jan-98 10-Jan-98 14-Jan-98	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 05:15 07:05 01:40 05:15 07:05 01:40 01:30 04:10 14:04 02:00 No data 03:00 16:46	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River ####, Muara Sabk b/w No. 1 Buoy & No. 2 Buoy No. 2 Buoy	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 04-40-005 11-15-00S 07-44-155 02-11-58S 02-11-58S 01-07-50N 01-02-36S 10-37-11S 03-30-00N No data No data	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 116-58-00 116-58-00 1104-57-01 102-09-33 100-22-36 117-17-54 107-10-00 No data No data	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 3,348 / No Data 182 34 92 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501 6,022 / 3,936 171 No Data 898 3,746 / 291	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat + Barge Cargo Cargo Cargo Tanker / No Data Tug Boat + Barge Cargo / No Data Tug Boat + Barge Cargo / No Data Fishing Boat Cargo / Tanker Tug Boat + Barge Cargo / Cargo Cargo / Cargo Fishing Boat No Data / No Data	Singapore Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize Indonesia Indonesia Belize Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Singapore Singap	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Sunken Sunken Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Fire Collision - / Collision Collision Collision Disphine Collision Stranding Collision Stranding Collision Sunken Drifting from Sri to Indon. Sunken	Nil + Nil Nil <td>Nil + Nil 5,328 * Nil Nil + Nil No Data /</td> <td>Sunken</td>	Nil + Nil 5,328 * Nil Nil + Nil No Data /	Sunken
388 389 389 390 391 392 393 393 394 395 397 398 399 397 398 399 400 401 400 401 402 404 404 405 406 4007 408 409 410 411 412 413 414 414	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 01-Oct-97 01-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 02-Oct-97	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 16:00 11:55 08:35 01:30 07:29 16:45 05:00 05:15 07:05 01:40 01:30 04:10 14:04 02:00 No data No data	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.4 Buoy No.4 Buoy PKI Pier of Pekalongan PKI Pier of Pekalongan Amutu Beasar Is. No data 21 NM from mouth of Berau No data Waters of Tg. Aru., Kab. Pasir	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 05-23-53N 05-23-53N 05-23-53N 05-23-53N 01-10-58N 01-10-58N 01-10-58N 02-11-58S 02-11-58S 02-11-58S 02-11-50N 01-02-36S 10-37-11S 03-30-00N No data	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 116-58-00 116-58-00 104-57-01 102-09-33 100-22-36 117-17-54 107-10-00 No data No data	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 3,348 / No Data 182 34 92 5,464 / 39 + 516 14,501 6,022 / 3,936 171 No Data 898 3,746 / 291 36	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Cargo Cargo Cargo / No Data Tug Boat + Barge Cargo Cargo / No Data Fishing Boat Fishing Boat Cargo / Tanker Tug Boat + Barge Cargo / Tanker Tug Boat + Barge Cargo / Tug Boat + Barge Passenger Passenger Passenger Passenger Cargo Cargo Fishing Boat No Data / No Data	Singapore Indonesia Indonesia Indonesia Singapore Indonesia Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Fire Collision Collision Collision Collision Collision Collision Stranding Collision Stranding Collision Sunken Drifting from Sri to Indon. Sunken	Nil + Nil No Data	Nil + Nil 5,328 * Nil No Data Nil	Sunken
388 389 389 390 391 392 393 393 394 395 397 398 397 398 397 398 399 400 401 402 400 404 404 405 406 4007 408 409 410 411 412 413 414 415 416 416	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 23-Sep-97 23-Sep-97 24-Sep-97 10-Oct-97 01-Oct-97 01-Oct-97 01-Oct-97 10-Oct-97 10-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 12-Dec-97 02-Nov-97 12-Dec-97 12-Dec-97 05-Jan-98 14-Jan-98	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 11:55 08:35 01:30 07:29 16:45 05:00 07:29 16:45 05:00 05:15 07:05 01:40 01:30 04:10 14:04 02:00 No data 19:00	WITA WITA WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy No.2	03-16-255 02-07-255 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 05-23-53N 05-23-53N 05-23-53N 05-23-53N 01-10-58N 01-10-58N 01-10-58N 02-11-58S 02-11-58S 02-11-58S 02-11-58S 02-11-58N 01-07-50N 01-02-36S 10-37-11S 03-30-00N No data No data	116-06-07 139-21-00 109-06-22 104-36-06 103-24-55 111-29-12 1112-50-00 116-58-00 116-58-00 116-58-00 1104-57-01 102-09-33 100-22-36 117-17-54 107-10-00 No data	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 3,348 / No Data 182 34 92 5,464 / 39 + 516 14,501 6,022 / 3,936 171 No Data 898 3,746 / 291 36 No Data	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Cargo Cargo Cargo / No Data Tug Boat + Barge Cargo Cargo / No Data Fishing Boat Fishing Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo / Tanker Tug Boat + Barge Cargo / Tanker Tug Boat + Barge Passenger Passenger Passenger Passenger Seishing Boat No Data No Data / No Data	Singapore Singapore Indonesia Indonesia Singapore Indonesia Singapore Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Belize / No Data Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Singapore + Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia	 / Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Stranding Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision Stranding Collision Collision Dolphine Collision Sunken Drifting from Sri to Indon. Sunken Collision Sunken Sunken Sunken Sunken 	Nil + Nil No	Nil + Nil 5,328 * Nil	Sunken
388 389 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 4112 413 414 415 416 414 415	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 22-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 01-Oct-97 02-Oct-97 03-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 02-Nov-97 22-Nov-97 12-Dec-97 05-Jan-98 14-Jan-98 14-Jan-98 03-Feb-98 03-Feb-98 03-Feb-98 03-Feb-98	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 02:00 05:15 07:05 01:40 01:30 04:10 14:04 02:00 No data 03:00 16:46 No data 12:00 00:00	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.2 Buoy No.4 Buoy No.4 Buoy No.4 Buoy No.4 Buoy PKI Pier of Pekalongan PKI Pier of Pekalongan Nama Is., Musi Nama Is., M	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 05-23-53N 01-07-50N 01-02-36S 10-37-11S 03-30-00N No data No data	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 103-24-55 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33 100-22-36 117-17-54 107-10-00 No data	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501 6,022 / 3,936 171 No Data 898 3,746 / 291 36 No Data 69 16	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Cargo Cargo Cargo Cargo / No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Fishing Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge Passenger Passenger Passenger Fishing Boat No Data No Data No Data Fishing Boat Fishing Boat	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Singapore + Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia	/ Stranding Sunken Fire Stranding / Collision to Pier Sunken Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision Stranding Collision Stranding Collision Stranding Collision Stranding Collision Stranding Collision Stranding Collision Sunken Drifting from Sri to Indon. Sunken Collision Sunken Fire	Nil + Nil	Nil + Nil 5,328 * Nil	Sunken
388 389 390 391 392 393 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418	16-Sep-97 16-Sep-97 16-Sep-97 16-Sep-97 19-Sep-97 21-Sep-97 22-Sep-97 23-Sep-97 23-Sep-97 24-Sep-97 24-Sep-97 24-Sep-97 01-Oct-97 01-Oct-97 01-Oct-97 02-Oct-97 03-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 21-Oct-97 02-Nov-97 22-Nov-97 12-Dec-97 05-Jan-98 14-Jan-98 14-Jan-98 13-Feb-98 03-Feb-98 03-Feb-98 03-Feb-98 11-Feb-98	20:00 13:26 18:30 20:07 07:00 12:48 08:00 03:00 11:55 08:35 01:30 07:29 16:45 05:00 02:00 02:00 02:00 02:15 07:05 01:40 01:30 04:10 14:04 02:00 No data 03:00 16:46 No data 12:00 00:00 10:30	WITA WIT WIB WITA WIB WIB WIB WIB WIB WIB WIB WIB WIB WIB	C Pier of Panjang Port No. IV Pier of Tg. Intan Port, Cilacap Mouth of Segintung River #####, Muara Sabk b/w No.1 Buoy & No.2 Buoy Tegal Port Navigational Channel, Salah Nama Is, Musi PKI Pier of Pekalongan PKI Pier of Pekalongan Nama Is, Musi Nama Is, Musi No data 21 NM from mouth of Berau No data 21 NM from mouth of Berau No data Waters of Tg, Aru., Kab, Pasir Panjang Strait Cilacap Limoi village, Ambahan Is,	03-16-25S 02-07-25S 00-05-22N 00-48-39N 01-10-58N 05-23-53N 05-23-53N 05-23-53N 01-02-36S 11-15-00S 07-44-15S 02-11-58S 01-07-50N 01-02-36S 10-37-11S 03-30-00N No data No data	116-06-07 139-21-00 109-06-22 104-36-06 104-36-06 104-36-06 104-36-06 104-36-06 110-36-06 111-29-12 112-50-00 116-58-00 115-30-10 104-57-01 102-09-33 100-22-36 117-17-54 107-10-00 No data No data	177+ 3,148 3,619 424 3,255 190 + 2,374 50 34 223 303 / No Data 99 / 291 209 3,348 / No Data 182 34 92 489 3,383 / 647 170 + 1,350 5,464 / 39 + 516 14,501 6,022 / 3,936 171 No Data 898 3,746 / 291 36 No Data 69 16 No Data	Tug Boat + Barge Cargo Cargo Tug Boat + Barge Tug Boat Cargo Cargo Cargo Cargo Cargo Cargo Cargo Cargo/No Data Tug Boat + Barge Cargo Cargo / No Data Tug Boat Fishing Boat Cargo Cargo / Tanker Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge Cargo Cargo / Tanker Tug Boat + Barge Passenger Passenger Passenger Fishing Boat No Data / No Data No Data / No Data	Singapore Singapore Indonesia Indonesia Singapore Singapore Indonesia Singapore + Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia Singapore + Indonesia No Data	 / Stranding Sunken Fire Stranding / Collision to Pier Sunken Stranding Sunken Stranding Collision - + Sunken Fire Collision Fallen to sea Fire Fallen to sea Engine Trouble Collision - / Collision to Dolphine Collision Stranding Collision Collision Collision Collision Stranding Collision Stranding Collision Sunken Drifting from Srit to Indon, Sunken Sunken Sunken Fire Engine Trouble Sunken Sunken Fire Engine Trouble Sunken 	Nil + Nil Nil <td>Nil + Nil 5,328 * Nil Nil Nil Nil <tr< td=""><td>Sunken</td></tr<></td>	Nil + Nil 5,328 * Nil Nil Nil Nil <tr< td=""><td>Sunken</td></tr<>	Sunken

B B	No.	Date	Time	Time Zone	Location	Latitude	Longuitud e	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
Image No. No. <t< td=""><td>420</td><td>26-Feb-98</td><td>04:00</td><td>WIB</td><td>Mansib river, Kec. Rimba Melintang, Bengkalis</td><td></td><td></td><td>No Data</td><td>No Data</td><td>No Data</td><td>Sunken</td><td>Nil</td><td>Nil</td><td></td></t<>	420	26-Feb-98	04:00	WIB	Mansib river, Kec. Rimba Melintang, Bengkalis			No Data	No Data	No Data	Sunken	Nil	Nil	
Process of the state of th	421	28-Feb-98	19:05	WIB	Coral reef of Jaunan Is, BL Nabire			702	Cargo and Passenger	Indonesia	Stranding	Nil	Nil	
Et Market 9 No.data No	422	02-Mar-98	23:00	WIT	Kolam Zona, Benoa Port area			28	Sishing Boat	Indonesia	Fire	Nil	Nil	
Bit Bit< Bit< Bit< Bit< Bit< Bit< Bit Bit Bit< Bit< Bit Bit Bit Bit<	423	04-Mar-98	No data	No data	Offshore Light Beacon, DSI No. 6009			No Data	No Data	No Data	Collision to Offshore Light Beacon, DSI No. 6009	Nil	Nil	
Bit Bit Number Number Columnet to Pare Number Columnet to Pare Number Number Number	424 425	04-Mar-98 06-Mar-98	00:00 22:45	WIB WIB	Parang Is., No data	No data	No data	No Data 31	No Data Motor Ship	No Data Indonesia	Sunken Fire	20 Nil	Nil Nil	
Bit Material Ma	426 427	08-Mar-98 10-Mar-98	23:30 08:26	WIT	No data Pier of Luwuk Port	No data	No data	929 929	No Data Cargo	No Data Indonesia	Collision to Pier Collision to Pier	Nil Nil	Nil Nil	
Interven Interven Virol Amer Politik Virol Amer Politik Virol Vi	428	10-Mar-98	09:00	WIT	Pier of Dili Port			4,743	Cargo	Indonesia Indonesia	Fire	Nil	Nil	
Distant Distant <t< td=""><td>430</td><td>18-Mar-98</td><td>10:30</td><td>WIB</td><td>Kayu Putih,</td><td></td><td></td><td>71</td><td>Tug Boat</td><td>Indonesia</td><td>Accident in work</td><td>Nil</td><td>Nil</td><td></td></t<>	430	18-Mar-98	10:30	WIB	Kayu Putih,			71	Tug Boat	Indonesia	Accident in work	Nil	Nil	
Balance Notes Number Constant Stranding Number Nu	431	19-Mar-98	13:00	WIB	Enggano Is.	01-03-00N	103-54-22	1,223	Cargo	Belize	Stranding	Nil	Nil	
Image: Constraint of the section of the sec	432	20-Mar-98	No data	No data	Glogok Indah Coast Kab			23	Fishing Boat	Indonesia	Stranding	Nil	Nil	
	400	00.14 00	00.15	WID	Kulonprogo, D. I.	N. L.	N	1.054	ND	T 1 .	D It is	N.11	N.11	
dia dia <td>433</td> <td>20-Mar-98 24-Mar-98</td> <td>18:50</td> <td>WIB</td> <td>Waters of Jangkit</td> <td>No data</td> <td>INO data</td> <td>1,054 76</td> <td>No Data No Data</td> <td>Indonesia</td> <td>Stranding</td> <td>Nil</td> <td>Nil</td> <td></td>	433	20-Mar-98 24-Mar-98	18:50	WIB	Waters of Jangkit	No data	INO data	1,054 76	No Data No Data	Indonesia	Stranding	Nil	Nil	
Bo Dot Solver Diff Solver Dif	435	29-Mar-98	07:00	WIT		01-20-23N	102-10-00	23	No Data	Indonesia Indonesia /	Sunken	Nil	Nil	
Process of the source	436	05-Apr-98	03:45	WIB	Waters of Seranah	01-02-30IN	102-04-30	115/6	Cargo / Motor Boat	Indonesia	Collision	N11 / N11	N11 / N11	
Bit Append	437	09-Apr-98	02:00	WIB	Tanah Glogat	02-21- 05N/S?	116-37-00	74	LST	Indonesia	Sunken	Nil	Nil	
Discription District Note Note Note Note Note 101 100	438	12-Apr-98	03:37	WIB	Kapuas Kecil River	00-00-09N	109-16-30	3,258 / 3,260	Cargo / Cargo	Indonesia / Indonesia	Collision	Nil	Nil	
11 11 12<	439	12-Apr-98	No data	No data	Sapudi Strait, about 200m from	00-01-08IN	109-16-06	3,260 6 / No Data	Fishing Boat / Motor	Indonesia /	Collision to motor	Nil / Nil	Nil / Nil	
Image: Section of the section is a section of the section is a section in the section in the section is a section in the section in the section is a section in the section is a section in the section is a section in the section in the section is a section in the section in the section is a section in the section is a section in the section is a section in the section in the section is a section in the section in the section is a section in the section in the section in the section is a section in the section in	441	19-Apr-98	05:00	WIB	Sukorame port	04-31-50S	120-27-50	1,445 *	Passenger	Indonesia	Stranding	Nil	Nil	
14 12 14 12 16 16 16 No Data No Data No Data Sunken Nu Nu 44 15 Attray 90 02.00 WTL Sunken Nu Nu <td< td=""><td>442</td><td>20-Apr-98</td><td>No data</td><td>No data</td><td>Sapudi Strait</td><td>06 41 535</td><td>108 25 00</td><td>No Data</td><td>Fishing Boat</td><td>Indonesia</td><td>Collision</td><td>Nil / Nil Nil</td><td>Nil / Nil</td><td></td></td<>	442	20-Apr-98	No data	No data	Sapudi Strait	06 41 535	108 25 00	No Data	Fishing Boat	Indonesia	Collision	Nil / Nil Nil	Nil / Nil	
445 15 May 9 02:00 WTA Visite the formal of marging between the base of	444	12-May-98	No data	No data	Sempa waters	00 41-003	100-20-00	No Data	No Data	No Data	Sunken	Nil	Nil	
446 18 May 98 0.300 WIT Per of Garward, Caliform Market Balance 22 / 21 No Data No Data Fire Nul / Nil Nil 447 18 May 98 12.15 WIT Caliform Market Balance 712 Tanker Indonesia Flooding Nil Nil 448 25-May 98 19.30 WIT England Status Nil Nil Nil 449 31-May 98 21.30 WIT England Status Nil Nil Nil 440 0.40.46 6.50 WIT England Status -	445	15-May-98	02:00	WITA	Coast of Belatung Village, Kec. Dawan Kab. Kelungkung			6	No Data	No Data	Sunken	Nil	Nil	
447 18 May 98 12 15 WIL Channel of propagal Balam 712 Tanker Indonesia Fibeding Nil 448 25 May 98 19.20 WIL Perturange NTB New Tangen and Design Propagation No. Data Passenger Indonesia Fibeding Nil Nil 440 31-May 98 21.30 WIL Perturange NTB New Tangen and Design Propagation Surken 3.0 Nil Nil 440 01-May 98 65.00 WIL Pert of Khassa 2.0 562 Passenger Indonesia Fiboding Nil Nil 451 12-Lune 80 66.00 WIL Pert of Passenger Indonesia Surken Nil All 452 12-Lune 80 00.00 WIL Pert of Passenger Indonesia Surken Nil All 453 12-Lune 80 00.00 WIL Pert of Passenger Indonesia Surken Nil All 454 12-Lune 80 00.00 WIL Pert of Passenger Passen	446	18-May-98	03:00	WIB	Pier of darurat tulehu			29 / 21	No Data	No Data	Fire	Nil / Nil	Nil / Nil	
448 25.May 9 19.30 WII Provideragen port. Observational and provideragen port. Observational and provideragen port. Non Data Passenger Indenesia Sumken 3 Nil 449 31.May 98 21.30 WII Bonglar Special Bonglar Special 31.9 Cargo Indenesia Flooding Nil Nil 449 01.May 98 21.30 WII Bonglar Special 31.9 Cargo Indenesia Sunken Nil Nil 440 09.June 8 65.0 WII Bonglar Special 41 Moler Ship Indenesia Sunken Nil Nil 451 12.June 8 00.00 WII Part March 100.00 12.92.230 25.5 KLM Indenesia Stranding Nil Nil 451 12.June 8 00.00 WII Part March 100.00 Nil Nil Nil Nil 451 10.10 Nil Nil Nil Nil Nil Nil 451 0.23.04 Nil Nil	447	18-May-98	12:15	WIB	Channel of Pangkal Balam			712	Tanker	Indonesia	Flooding	Nil	Nil	
440 31.May-98 21.30 WTA Pier of Numass Sander Singlar (Special Landar Pier) Singlar (Spe	448	25-May-98	19:30	WIB	Penyebrangan port, Kayangan NTB (Nusa Tenggara Barat)			No Data	Passenger	Indonesia	Sunken	3	Nil	
cto 0 sturn 98 Nil Nil Nil 451 12 Jun-98 0 stor W1B Per of Pandharg 12 41 Motor Ship Indenesia Sturnen Nill 64 453 20 Jun-98 13:30 W1B Anget Strait 01:38:317 75 Cargo Indenesia Sturnen Nill Nill Nill 453 20 Jun-98 19:30 W1B Anget Strait 01:38:317 75 Cargo Indenesia Sturnen Nill Nill Nill 454 20 Jun-98 0:000 W1B Ruman Balak Rs, Babout 19M from Babout 19M from Bab	449	31-May-98	21:30	WITA	Pier of Khusus Bongkar (Special Loading Pier)			319	Cargo	Indonesia	Flooding	Nil	Nil	
451 12 Jun 98 08:00 WIB Pier of Panda Phs 11 Motor Ship Indonesia Fire Nil Nil All 452 18:Jun 98 00:30 WIB Pier of Panda Phs 01.28:015 102.00:19 76 Cargo Indonesia Sunken Nil 64 453 22.Jun 98 00:00 WIB Rumal Blak Is 04.20:05 102.25:00 55 KLM Indonesia Stranding Nil Nil 451 02.Jun 98 00:00 WIB Rumal Blak Is 04.20:05 102.25:00 55 KLM Indonesia Stranding Nil Nil 450 02.Jul 98 04:00 WITA Tig. Baruta, about 16 No Data No Data Sunken Nil 92 451 15.Jul 98 06:25 WIB No data Ne data Ne data Ne data Nil	450	09-Jun-98	05:00	WIB	South part of Jawa Sea			592	Passenger	Indonesia	Sunken	Nil	Nil	
des 18-bun 68 20.30 Wills Pier of Prenda Pks 01-28 to 153 102 00-16 75 Carge Indonesia Sunken Nill 64 de5 20-bun 68 00:00 WIIB - 04-32 0-55 RKM Indonesia Fire Nill Nill - de5 20-bun 68 0.00 WIIB - 04-32 0-55 RKM Indonesia Stranding Nill Nill de5 20-bun 68 0.02.5 WIIB - 04-32 0-51 No Data No Data Stranding Nill Nill - - 16 No Data No Data Sunken Nill Nill - - - 16 No Data No Data Sunken Nill Nill - - 16 No Data	451	12-Jun-98	08:00	WIB	Pier of Palembang Port			41	Motor Ship	Indonesia	Fire	Nil	Nil	
164 22-Jun-98 0400 WIB Decision 04-32-04S 120-25-00 55 KLM Indonesia Fire Nil Nil 455 29-Jun-98 19:00 WIB about 1NM from No Data No Data No Data Indonesia Stranding Nil Nil 456 02-Jul-98 04:02 WIB about 1NM from No Data No Data No Data Sunken Nil Nil 457 09-Jul-98 06:02 WIB Motata No data 244 LST Indonesia Sunken Nil Nil 459 15-Jul-98 19:00 WIB 76:02:02 104-57:41 5 / No Data No Data Sunken Nil Nil 460 16-Jul-98 02:30 WIB 02:36:02 104-57:43 5 / No Data No Data Sunken Nil Nil Nil 461 7-Jul-98 04:00 WITA Sunken Nil Nil Nil Nil Nil <t< td=""><td>452 453</td><td>18-Jun-98 20-Jun-98</td><td>20:30</td><td>WIB</td><td>Pier of Pemda Pks Anggit Strait</td><td>01-28-10S 01-58-53N</td><td>102-06-19</td><td>76 75</td><td>Cargo</td><td>Indonesia Indonesia</td><td>Sunken Sunken</td><td>Nil</td><td>64 Nil</td><td></td></t<>	452 453	18-Jun-98 20-Jun-98	20:30	WIB	Pier of Pemda Pks Anggit Strait	01-28-10S 01-58-53N	102-06-19	76 75	Cargo	Indonesia Indonesia	Sunken Sunken	Nil	64 Nil	
455 29-Jun-98 19:00 WIB Rumin Joan Association and Link about ablat mone link about m	454	22-Jun-98	00:00	WIB	Dumai Dalah Ia	04-32-04S	120-25-00	55	KLM	Indonesia	Fire	Nil	Nil	
466 02-Jul-98 0460 WITA Tig, Baruta, about 6MM from Bays 16 No Data No Data Sunken Nil Nil 457 09-Jul-98 06-02.5 WIB No data	455	29-Jun-98	19:00	WIB	about 1NM from Bakauheni Port			No Data	No Data	Indonesia	Stranding	Nil	Nil	
457 09-Jule8 0625 WIB No data No data No data No data No data No data No model Sunken Nil 552 455 15-Jul 98 19:00 WIB Tg, Baruta, about 6MM from Baus 16 No Data Indonesia Sunken Nil Nil 460 16-Jul 98 02:30 WIB 02:56-025 104:57.41 5 / No Data Motor Ship / Unknwon Indonesia Callision 8 / No Data Nil Nil 461 17-Jul 98 22:50 WIB 02:56-025 104:67.41 5 / No Data Motor Ship / Unknwon Indonesia Sunken Nil Nil Nil 462 21-Jul 98 04:00 WIB No data No data No data 29 Cargo Indonesia Sunken Nil 12:3-36 463 04-Jul 98 No data No dat	456	02-Jul-98	04:00	WITA	Tg. Baruta, about 6NM from Baus			16	No Data	No Data	Sunken	Nil	Nil	
1000000000000000000000000000000000000	457 458	09-Jul-98 15-Jul-98	06:25 No data	WIB No data	No data Makassar Strait	No data	No data	244 28	LST No Data	Indonesia Indonesia	Sunken Sunken	Nil Nil	592 Nil	
Image: construction of the state o	459	15-Jul-98	19:00	WIB	Tg. Baruta, about			16	No Data	No Data	Sunken	Nil	Nil	
461 17-Jul-98 23:55 WIB 05-52-10S 105-46-30 4.872 Ferry, Passenger Indonesia Stranding Nil Nil 462 21-Jul-98 04:00 WIB 03 Fishing Boat Indonesia Sunken 1 Nil 463 26-Jul-98 10:00 WIB No data No data 03-33-25N 104-57-58 225 No Data No Data Sunken Nil Nil 464 30-Jul-98 23:00 WIB No data No data No data No data No data 29 Cargo Indonesia Broken Nil Nil 466 04-Aug-98 14:48 WIB Office, North Side 239 Passenger Indonesia Machine Trouble Nil Nil Nil 467 11-Aug-98 12:30 WIB Kustumbar Village, Kee, Dawan, Ka. 6 Row boat Indonesia Sunken Nil Nil Nil 468 12-Aug-98 16:00 WIB <	460	16-Jul-98	02:30	WIB	onwinom Baus	02-56-02S	104-57-41	5 / No Data	Motor Ship / Unknwon	Indonesia / Indonesia	Collision	8 / No Data	Nil / No Data	
442 21-Jul-98 04.00 WTA Tabanan Sea 3 Fishing Boat Indonesia Sunken 1 Nil 463 26-Jul-98 1000 WIB 03-33-25N 104-57-58 225 No Data No Data Sunken Nil Nil 464 30-Jul-98 2300 WIB No data No data No data 29 Cargo Indonesia Sunken Nil Nil 12 + 36 465 01-Aug-98 No data No data No data No data No Acargo Indonesia Broken Nil Nil Nil 466 04-Aug-98 14:48 WIB Gilimanuk Port Office, North Side of Red Light Beacon 239 Passenger Indonesia Machine Trouble Nil Nil Nil 467 11-Aug-98 12:30 WIB Katur Coast, Kee. Dawan, Ka. Light Kasumba Village, Kee. Dawan, Ka. 6 Row boat Indonesia Sunken Nil 233 Timber 469 14-Aug-98 16:00 WIB <td>461</td> <td>17-Jul-98</td> <td>23:55</td> <td>WIB</td> <td>South Side of</td> <td>05-52-10S</td> <td>105-46-30</td> <td>4,872</td> <td>Ferry, Passenger</td> <td>Indonesia</td> <td>Stranding</td> <td>Nil</td> <td>Nil</td> <td></td>	461	17-Jul-98	23:55	WIB	South Side of	05-52-10S	105-46-30	4,872	Ferry, Passenger	Indonesia	Stranding	Nil	Nil	
abs.zb-sul-ysturouWilsUS-33-ZON 104-37-38225No DataNo DataNo DataSunkenNilNilNil46430-Jul-y823.00WIBNo dataNo dataNo data29CargoIndonesiaSunkenNil12 + 3646501-Aug-98No dataNo dataOno-donopuro Bay102PassengerIndonesiaBrokenNilNilNil46604-Aug-9814:48WIBGillimanuk Port Office. North Side239PassengerIndonesiaMachine TroubleNilNil46711-Aug-9812:30WIBKusumba Village. Ke. Dawan, Ka.6Row boatIndonesiaSunkenNilNil46812:Aug-9801:00WIB04-14-065106-14-50188CargoIndonesiaFlooding1Nil46914-Aug-9816:00WIB02-23-00N101-40-01No DataPassenger/ PalukIndonesiaFlooding1Nil47017-Aug-9804:55WIB02-32-00N101-40-01No DataPassenger / BalukIndonesiaFloodingNilNil47119-Aug-9816:00WIB03-35-055113-07-0035No DataIndonesiaFloodingNilNil47222-Aug-9816:00WIB03-35-055113-07-0035No DataIndonesiaSunkenNil23247325-Aug-9806:10WIB03-35-055<	462	21-Jul-98	04:00	WITA	Tabanan Sea	00.00.077	104 77	3	Fishing Boat	Indonesia	Sunken	1	Nil	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	463	26-Jul-98 30- Jul-98	23.00	WIB	No data	No data	104-57-58	225	No Data Cargo	INO Data	Sunken	Nil	1N11 12 + 36	
466 04-Aug-98 14:48 WIB WIB 580m from Gilimanuk Port of Red Light Beacon (Kee, Dawan, Ka, Lunckume 239 Passenger Indonesia Machine Trouble Nil Nil 467 11-Aug-98 12:30 WIB Batur Coast, Kusumba Village, Kee, Dawan, Ka. 6 Row boat Indonesia Sunken Nil Nil 468 12-Aug-98 01:00 WIB Ummember of KALAP 04-14-06S 106-14-50 188 Cargo India Sunken Nil 293 Timber 469 14-Aug-98 6:00 WIB 1Mf from branch of KALAP 6 No Data Indonesia Flooding 1 Nil 470 17-Aug-98 04:55 WIB 02-23-00N 101-40-01 No Data Passenger/Bulk Carrier Indonesia Flooding Nil Nil 471 19-Aug-98 16:00 WIB 03-35-05S 113-07-00 35 No Data Indonesia Flooding Nil Nil 473 25-Aug-98 No data No data </td <td>465</td> <td>01-Aug-98</td> <td>No data</td> <td>No data</td> <td>Dono-donopuro Bay</td> <td>110 udta</td> <td>110 udta</td> <td>102</td> <td>Passenger</td> <td>Indonesia</td> <td>Broken</td> <td>Nil</td> <td>Cows Nil</td> <td></td>	465	01-Aug-98	No data	No data	Dono-donopuro Bay	110 udta	110 udta	102	Passenger	Indonesia	Broken	Nil	Cows Nil	
467 11-Aug-98 12:30 WIB Batur Coast, Kusumba Village, Kec. Dawan, Ka. Lungkung 6 Row boat Indonesia Sunken Nil Nil 468 12-Aug-98 01:00 WIB 04-14-06S 106-14-50 188 Cargo India Sunken Nil 293 Timber 469 14-Aug-98 6 No Data Indonesia Flooding 1 Nil 470 17-Aug-98 04:55 WIB 02-23-00N 101-40-01 No Data Passenger / Bulk Carrier Indonesia Flooding 1 Nil 471 19-Aug-98 16:00 WIB 03-35-05S 113-07-00 35 No Data Indonesia Flooding Nil Nil 472 12-Aug-98 16:00 WIB 03-35-05S 113-07-00 35 No Data Indonesia Flooding Nil Nil 472 12-Aug-98 06:10 WIB Bali Strait 676 Ferry Indonesia Stranding Nil N	466	04-Aug-98	14:48	WIB	580m from Gilimanuk Port Office, North Side of Red Light Beacon			239	Passenger	Indonesia	Machine Trouble	Nil	Nil	
468 12-Aug-98 01:00 WIB 04-14-06S 106-14-50 188 Cargo India Sunken Nil 293 Timber 469 14-Aug-98 16:00 WIB INM from branch of KALAP 6 No Data Indonesia Flooding 1 Nil 470 17-Aug-98 04:55 WIB 02-23-00N 101-40-01 No Data Passenger / Bulk Carrier Indonesia Flooding 1 Nil 471 19-Aug-98 16:00 WIB 03-35-055 113-07-00 35 No Data Indonesia Flooding Nil Nil 472 22-Aug-98 106:10 WIB 06-03-00S 106-53-30 1,165 Cargo Indonesia Sunken Nil 232 473 25-Aug-98 06:10 WIB Bali Strait 676 Ferry Indonesia Stranding Nil Nil 474 25-Aug-98 06:10 WIB Bali Strait 14,581 Passenger Indonesia <	467	11-Aug-98	12:30	WIB	Batur Coast, Kusumba Village, Kec. Dawan, Ka. Lungkung			6	Row boat	Indonesia	Sunken	Nil	Nil	
469 14-Aug-98 16:00 WIB KALAP 6 No Data Indonesia Flooding 1 Nil 470 17-Aug-98 04:55 WIB 02-23-00N 101-40-01 No Data Passenger / Bulk Carrier Indonesia / Panama Collision 4 Nil 471 19-Aug-98 16:00 WIB 03-35-05S 113-07-00 35 No Data Indonesia Flooding Nil Nil 472 22-Aug-98 11:15 WIB 06-03-00S 106-53-30 1,165 Cargo Indonesia Sunken Nil 232 473 25-Aug-98 06:10 WIB Ball Strait 6676 Ferry Indonesia Stranding Nil Nil 474 25-Aug-98 No data No data Pier of Dil Port 14,581 Passenger Indonesia Stranding Nil Nil 475 05-Sep-98 22:00 WIT Kawa Village, Kec. Piru Seram Barat, Kab. Maluku 173 Cargo Indonesia Sunken Nil 1,000 476 08-Sep-98 19:00	468	12-Aug-98	01:00	WIB	1NM from branch of	04-14-06S	106-14-50	188	Cargo	India	Sunken	Nil	293	Timber
470 17-Aug-98 04:55 WIB 02-23-00N 101-40-01 No Data Passenger / Bulk Carrier Indonesia / Panama Collision 4 Nil 471 19-Aug-98 16:00 WIB 03-35-05S 113-07-00 35 No Data Indonesia Flooding Nil Nil 472 22-Aug-98 11:15 WIB 06-03-00S 106-53-30 1,165 Cargo Indonesia Sunken Nil 22.3 473 25-Aug-98 06:10 WIB Bali Strait 06-03-00S 106-53-30 1,165 Cargo Indonesia Sunken Nil 23.2 474 25-Aug-98 06 ata No data Pier of Dili Port 14,581 Passenger Indonesia Stranding Nil Nil 475 05-Sep-98 22:00 WTT Kawa Village, Kec. Piru Seram Barat, Kab, Maluku 173 Cargo Indonesia Sunken Nil 1,000 476 08-Sep-98 19:00 WIB SELAM river channel, Dusun Pagkal Rava 34 Cargo Indonesia Sunken Nil 50	469	14-Aug-98	16:00	WIB	KALAP			6	No Data	Indonesia	Flooding	1	Nil	
471 19-Aug-98 16:00 WIB 03-35-05S 113-07-00 35 No Data Indonesia Flooding Nil Nil 472 22-Aug-98 11:15 WIB 06-03-00S 106-53-30 1.165 Cargo Indonesia Sunken Nil 232 473 25-Aug-98 No data No data Pier of Dili Port 14,581 Passenger Indonesia Stranding Nil Nil 475 05-Sep-98 22:00 WIT Kawa Village, Kec. 173 Cargo Indonesia Fire Nil 1,000 476 08-Sep-98 19:00 WIB SELAM river 173 Cargo Indonesia Sunken Nil 1,000 477 09-Sep-98 19:00 WIB SELAM river 173 Cargo Indonesia Sunken Nil 1,000 477 09-Sep-98 No data No data Tg. Redap No Data No Data Indonesia Sunken Nil 50 478 12-Sep-98 22:15 WIB East side of Kaget No Data / No Data </td <td>470</td> <td>17-Aug-98</td> <td>04:55</td> <td>WIB</td> <td></td> <td>02-23-00N</td> <td>101-40-01</td> <td>No Data</td> <td>Passenger / Bulk Carrier</td> <td>Indonesia / Panama</td> <td>Collision</td> <td>4</td> <td>Nil</td> <td></td>	470	17-Aug-98	04:55	WIB		02-23-00N	101-40-01	No Data	Passenger / Bulk Carrier	Indonesia / Panama	Collision	4	Nil	
Arrow Data Strait Description Inducesia Humanisation Multi Laboration 473 25-Aug-98 06 100 WIB Bali Strait 676 Ferry Indonesia Stranding Nil 474 25-Aug-98 No data No data Pier of Dill Port 14,581 Passenger Indonesia Stranding Nil Nil 475 05-Sep-98 22:00 WIT Reave Village, Kec. 173 Cargo Indonesia Fire Nil 1,000 476 08-Sep-98 19:00 WIB SELAM river 173 Cargo Indonesia Sunken Nil 50 477 09-Sep-98 No data No data Tg. Redap No Data No Data No Data Indonesia Stranding and Flooding Nil 330 478 12-Sep-98 22:15 WIB East side of Kaget Is No Data No Data /No Data No Data /No Data Collision Nil / Nil Nil / Nil 479 16-Sep-98 20:00 WIB 104 08 30 296 Cargo Lodenacia Sunken Nil Nil	471 479	19-Aug-98 22-Aug-98	16:00	WIB		03-35-055	113-07-00	35	No Data Cargo	Indonesia	Flooding	Nil	Nil 232	
4/4 23-Aug-36 ING data File of Dill Port 14,381 Passenger Indonesia Stranding Nil 475 05-Sep-98 22:00 WIT Pesisir Wilyoto, Kawa Village, Kec. Piru Seram Barat, Kab. Maluku 173 Cargo Indonesia Fire Nil 1,000 476 08-Sep-98 19:00 WIB SELAM river channel, Dusun Pangkal Rava 34 Cargo Indonesia Sunken Nil 50 477 09-Sep-98 No data No data Tg. Redap No Data No Data Indonesia Stranding and Flooding Nil 330 478 12-Sep-98 22:15 WIB East side of Kaget Is No Data No Data No Data Indonesia Collision Nil / Nil Nil / Nil 479 16-Sep-98 20:00 WIB 00-36- 104 08:30 996 Cargo Indonesia Sunken Nil Nil	473	25-Aug-98	06:10	WIB	Bali Strait	30 00 000	100 00 00	676	Ferry	Indonesia	##### fallen to	Nil	Nil	
Image: Arrow of the bound bulk 476 08-Sep-98 19:00 WIB SELAM river channel, Dusun Pangkal Rava 34 Cargo Indonesia Sunken Nil 50 477 09-Sep-98 No data No data Tg. Redap No Data No Data Indonesia Stranding and Flooding Nil 330 478 12-Sep-98 22:15 WIB East side of Kaget Is No Data / No Data / No Data / No Data Indonesia Collision Nil / Nil Nil / Nil 479 16-Sep-98 20:00 WIB 00-36- 104 08:30 996 Cargo Indonesia Sunken Nil Nil	474	25-Aug-98 05-Sep-98	1No data 22:00	WIT	Pier of Dili Port Pesisir Wilyoto, Kawa Village, Kec. Piru Seram Barat			14,581 173	Passenger Cargo	Indonesia Indonesia	Stranding Fire	Nil	Nil 1,000	
Vertical difference Pangkal Raya Vertical difference Pangkal Raya Vertical difference Pangkal Raya Vertical difference 477 09-Sep-98 No data No data Tg. Redap No Data No Data No Data Indonesia Stranding and Flooding Nil 330 478 12-Sep-98 22:15 WIB East side of Kaget Is. No Data / No Data / No Data Indonesia / Indonesia / Indonesia / Indonesia / Indonesia / Indonesia Nil / Nil Nil / Nil 479 16-Sep-98 20:00 WIB 00-36- 104 08 30 996 Corrector Vertical displaya Nil Nil	476	08-Sep-98	19:00	WIB	Kab. Maluku SELAM river channel, Dusun			34	Cargo	Indonesia	Sunken	Nil	50	
478 12-Sep-98 22:15 WIB East side of Kaget Is. No Data / No Data No Data / No Dat	477	09-Sep-98	No data	No data	Pangkal Raya Tg. Redap			No Data	No Data	Indonesia	Stranding and	Nil	330	
Image: April 16 San 98 20:00 WIR Dota Indonesia Constant Marrie 141 Marrie 141 479 16 San 98 20:00 WIR 00:36- 104 08:30 926 Carrie 15 damagia Sumkan Marrie 141 Marrie 141	478	12-Sep-98	22:15	WIB	East side of Kaget			No Data / No	No Data / No Data	Indonesia /	r tooding Collision	Nil / Nil	Nil / Nil	
19N/C2 104-00-30 040 Cargo Indonesia Sunken Nii Nii Nii	479	16-Sep-98	20:00	WIB	Is.	00-36-	104-08-30	Data 826	Cargo	Indonesia Indonesia	Sunken	Nil	Nil	

N	D (Time	T .:	T 1	Longuitud	а т		F 1 .	W: 1 (A)	1 /2 / 2	Loading	
INO.	Date	Time	Zone	Location	Latitude	e	Gross 1 on	Kind of Ship	Flag	Kind of Accident	Victims	Loss (Ton)	Remarks
480	25-Sep-98 05-Oct-98	No data 07:30	No data WIB		05-48-07S 01-20-00N	105-35-02	<u>387</u> 98	No Data No Data	Singapore	Sunken	Nil	Nil	
499	12 Oct 08	04:40	WID	South side of Merak			5 594	Bassandan	Indonesia	Stronding	NU	NU	
402	10.0.1.00	04.40	WIB	Is.	01.04.0031	100 57 00	5,584	Fasseliger	Indonesia	Stranding	INII	INII	
483	19-Oct-98	06:00	WIB	To Balai Karimun	01-24-30N	102-57-23	No Data	No Data	Indonesia	Sunken	Nil	Nil	
484	23-Oct-98	09:00	WIB	Port			39	Passenger	Indonesia	Fire	Nil	Nil	
485	24-Oct-98	No data	No data	C IT II	03-55-00S	122-50-00	262	Cargo	No Data	Stranding	Nil	Nil	
486	26-Oct-98 04-Nov-98	20:00	WITA	Ganteng Coast			174	No Data	Indonesia	Sunken	Nil	16 *	
488	09-Nov-98	04:00	WIB		01-04-20N	103-46-04	183	No Data	Honduras	Stranding	Nil	Nil	
489	09-Nov-98	13:30	WIB	West side of			2	KMN	Indonesia	Sunken	Nil	Nil	
490	10-Nov-98	10:00	WIB	Darombong	00-48-00N	104-29-00	4.873	No Data	Indonesia	Sunken	Nil	Nil	
				Larantuka Strait,									
491	10-Nov-98	12:00	WITA	about 5 NM from			No Data	No Data	Indonesia	Sunken	4	Nil	
492	11-Nov-98	05:20	WIB	Larantuka Port	06-55-07S	112-43-48	174	Call Sign	Indonesia	Sunken	Nil	Nil	
493	13-Nov-98	23:00	WIB		04-20-55S	121-08-55	413	Passenger	Indonesia	Sunken	8	15 cars	
494	15-Nov-98 16-Nov-98	04:45 No data	WITA No data	No data	01-34-14S	119-05-11 No data	No Data	No Data	Indonesia	Sunken Machine Trouble	Nil	Nil	
406	10 Nov 08	No doto	No doto	12 NM from Muara	i to data	110 data	972	KI M	Indonesia	Sunkon	0	NU	
490	19-1007-98	No data	No data	Sebangu			273	KLM	Indonesia	Sunken	9	INII	
497	20-Nov-98	23:00	WITA	25 NM to west side from Kabaruan Is			103	No Data	Indonesia	Machine Trouble	Nil	Nil	
498	25-Nov-98	00:15	WIB	Hom Rabardan 13.	05-52-02S	108-45-05	5,837	Ferry	Indonesia	Stranding	Nil	Nil	
499	09-Dec-98	02:00	WIB	Sulawai Saa ahaat	02-52-42S	104-08-45	456	Cargo	Indonesia	Sunken	Nil	400	
500	10-Dec-98	08:15	WITA	21 NM to North-			440	LCT	Indonesia	Sunken	Nil	Nil	
				west from Menado			-	-					
501	11-Dec-98	20:00	WIB	Dam Changel To	05-37-00S	108-47-00	269	LCT	Indonesia	Lasing Putus	Nil	Nil	
502	15-Dec-98	17:23	WIB	Priok			14,501	Passenger	Indonesia	water	Nil	Nil	
503	16-Dec-98	No data	No data	Surabaya Port			No Data	No Data	No Data	Collision to ship	Nil	Nil	
504	16-Dec-98	03:00	WIB	No data	No data	No data	45 / No Data	River Boat / No Data	Indonesia / No	Collision	2	Nil	
505	16-Dec-98	No data	No data	Coast of Jawa Sea			290	Sailig Boat	Indonesia	Stranding	Nil	Nil	
506	27-Dec-98	19:30	WIB	No data	No data	No data	210	Cargo	Indonesia	Collision to Cable	Nil	Nil	
507	29-Dec-98	19.07	WIR		02-32-005	107-57-00	134	Caron	Indonesia	of PLN at Sunken	Nil	Nil	
508	02-Jan-99	07:05	WIB	No data	No data	No data	50	Cargo	Indonesia	Sunken	Nil	Nil	
509	04-Jan-99	No data	No data	No data	No data	No data	No data	No data	No data	Collision	Nil	Nil	
510	05-Jan-99	14:00	WITA	Pier of Samudera Bitung			1,229	Cargo	Indonesia	Fire	Nil	Nil	
				at Kolam Bandar									
511	05-Jan-99	15:00	WITA	Zona, waters of			43	Fishing Boat	Indonesia	Fire	Nil	Nil	
512	07-Jan-99	20:00	WIB	Benoa Port	00-15-50S	103-51-25	No data	No data	Indonesia	Sunken	1	Nil	
513	08-Jan-99	13:15	WITA	Manado Port			155	Cargo	Indonesia	Fire	Nil	11	
514	12-Jan-99	00:30	WIB	No doto	02-02-10S	104-59-58 No doto	228	No data	Indonesia	Sunken	Nil	Nil	
510	14-Jaii-99	10.45	WIB	Durai village, Kec.	INU UALA	INU Udla	3,740	Cargo	Thuonesia	Comsion to pier	INII NUL	NII	
516	15-Jan-99	No data	No data	Moro			35	No data	Indonesia	Flooding	NII	NII	
517	20-Jan-99	07:15	WIT	Waters of Tg. Kopondai, Eloros			171	Cargo	Indonesia	Stranding	Nil	Nil	
518	02-Feb-99	04:00	WITA	Ropolidal, Flores	04-32-00S	120-28-00	1,080	Ferry	Indonesia	Stranding	Nil	Nil	
				Waters of									
519	05-Feb-99	19:30	WIB	Kalumpang Village, Koc Mantangan			25	Kpl ASD	Indonesia	Fire and Sunken	9	Nil	
				Kab. Kapuas									
520	06-Feb-99	23:00	WIB		00-37-20N	107-49-59	148	KLM	Indonesia	Sunken	308	Nil	
521	07-Feb-99 07-Feb-99	07:30	WIB	Nabire Port	00-20-06N	107-49-06	3,600	Passenger	San Lorenzo Indonesia	Fire Collision to pier	Nil	Nil	
523	08 Eab 00	05:30	WIT	Waenibe Port, West			59	Tug Boat	Indonesia	Stranding	Nil	Nil	
323	00-1-60-33	05.50	WII	side of Pier			55	Tug Doat	indonesia	Deservation fallow	INI	INI	
524	14-Feb-99	12:35	WITA	No data	No data	No data	3,079	Passenger	Indonesia	to sea	1	Nil	
525	16-Feb-99	21:30	WIT	Nabire Port			14,501	Passenger	Indonesia	Collision to pier	Nil	Nil	
526 527	17-Feb-99 21-Feb-90	03:10 No data	WIB No data	Jawa Sea No data	No data	No data	498 No data	Cargo No data	Indonesia	Sunken	Nil	Nil 550	
361	** 1.69-99	110 udtd	and udtd	North side of	in udla	ino udla	110 uald	i to uaid	monesia	Suikell	1111	330	
528	22-Feb-99	09:30	WIB	Bawean Is., 10 NM			143	Fishing boat	Indonesia	Sunken	Nil	499	
<u> </u>				to sea about 40 NM from	-	-		_	-		-	-	-
529	26-Feb-99	No data	No data	Surabaya			9,145	Cargo	Korea	Poisoned / Sick	Nil	Nil	
530	27-Feb-99	14:00	WITA	Benoa Port, Kolam			38	Fishing Boat	Indonesia	Fire	Nil	Nil	
531	14-Mar-99	09:00	WIB	Zona	01-51-10S	113-58-04	3	Boat	Indonesia	Sunken	Nil	Nil	
532	14-Mar-99	No data	No data	Bengkurat			534	Cargo	Indonesia	Flooding and	Nil	Nil	
533	14-Mar-99	09.30	WIR	Lampung Bay Kahayan river			3	<u>Kb</u>	Indonesia	Supken	Nil	Nil	
534	14-Mar-99	14:15	WIT	No data	No data	No data	1,546	Passenger	Indonesia	No data	Nil	Nil	
F.0	10.1	10.17		Tamparai port,			100	1.00		G			
535	19-Mar-99	10:15	WITA	Tanah Merah, East			468	LST	Indonesia	Capsized	Nil	Nil	
590	20 Mar 00	00.15	No dot:	Pier of Balikpapan			14 501	Dagoond	Indona-!-	Colligion to Di-	NI:I	NU	
530	~0-mar-99	03:15	ino data	Port			14,301	r assenger	muonesia	Comsion to Pier	1111	1111	
537	20-Mar-99	09:30	WITA	Fishery Pier of Pontianak			57	Tug Boat	Indonesia	Sunken	Nil	Nil	
500	94 M 00	No d-t	No d-t	i viitiaiidk	00.28.455	109 50 40	995	Motor Shin	Indor!-	Stranding and	N21	N ²¹	
530	24-ividf-99	at co	No uata		00-20-435	102-30-40	40J	Mat 11	T	sunken	INII NTI	INII NTI	
539 540	∠1-Mar-99 08-Apr-99	21:30	NO data WITA	Pamukan Bav	05-33-06S	105-16-28	15,836	Motor ship Motor Shin	India	Stranding Sunken	Nil	N11 13	
541	11-Apr-99	01:30	WIB	Tg. Priok port			No Data	Motor Ship	Indonesia	Fire	Nil	Nil	
549	14 Apr 00	99.15	WITA	Bridge of			775	Barga	Indonesia	Colligion	NI	NB	
J4Z	14-Apr-99	22:15	WIIA	Asam Anak Muara			115	Darge	muonesia	Comsion	INII	INII	
543	15-Anr-90	16:30	No data	near the Buoy No.			457	Motor Shin	Indonesia	Sunken	Nil	Nil	
545	16 Apr 00	19.1"	WID	12, ?????	04 56 995	149 40 00	No Dot-	Motor Shi-	Indone-!-	Strandi	NI	NI	ļ
344	10-Apr-99	13:15	WIB	b/w Kuning Areng	04-30-225	142-40-00	ino Data	motor Ship	muonesia	Scranung	INII	INII	
545	16-Apr-99	No data	No data	Is. And Dayung			20	KLM	Indonesia	Sunken	Nil	Nil	
540	17-Apr 00	00.00	WIP	Dayangan Is.	01-15 005	104 43 00	9.4	Motor Shin	Indonesia	Sunkon	9	Nil	-
540 547	28-Apr-99	10:10	WITA		05-36-30S	115-33-30	No Data	Motor Ship	Indonesia	Fallen to sea	Nil	Nil	
548	02-May-99	12:00	WIB	about 2 NM to			No Data	No Data	indonesia	Sunken	Nil	Nil	
540	05-May 00	22.00	WIT	south from Lembeh	03-53-005	133-35 00	No Data	No Data	No Data	Sunkon	1	Nil	
540	55 may-33	~~.00		N TIC	00 00 000	100 00-00	05	T I	Independent	Combon	N.'1	100 10	

No.	Date	Time	Time	Location	Latitude	Longuitud	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading	Remarks
551	08-May-99	04:00	WIB	No.5 Quay, Sunda		e	No Data	No Data	Indonesia	Fire	Nil	Nil	
552	14-May-99	20:00	WITA	Cappa Ujung Port,			153	No Data	No Data	Fire	Nil	5	
553	18-May-99	19:10	WITA	Pare Pare	08-27-59S	119-19-05	672	No Data	Indonesia	Stranding	Nil	Nil	
554	22-May-99	12:30	WIT	river, Kec. Sungai			1,378	No Data	Indonesia	Fire	2	Nil	
555	23-May-99	02:30	WIB	Apit	03-01-005	106-16-45	3.198 / 257	No Data	Singapore /	Collision	1	Nil	
556	26-May-99	No data	No data	No data	No data	No data	No Data	No Data	Indonesia Indonesia	Collision	6	Nil	
557	31-May-99	22:00	WITA	No data	07-23-00S No data	106-16-45 No data	225	LCT Supply boat	Indonesia Indonesia	Capsized	2 Nil	Nil	
559	15-Jun-99	07:00	WIB	No data	03-24-00S	113-15-05	145	KLM	Indonesia	Sunken	Nil	150	
560	16-Jun-99	No data	No data	Coral reef around Cempedak Selatan			136	No Data	No Data	Stranding	Nil	Nil	
561	30-Jun-99	02:00	WITA	Is., Kendari Makassar Strait			186	KLM	Indonesia	Sunken	Nil	275	
562	03-Jul-99	04:00	WIT		03-52-00S	112-30-00	281	KLM	Indonesia	Sunken Flooding and	4	635 *	
563	03-Jul-99	23:00	WIB	Pior of Nusantara	02-58-00S	111-21-04	329	Barge	Indonesia	Sunken	Nil	381	
564	07-Jul-99	15:10	WIB	Bitung Port			60	Motor Ship	Indonesia	Fire	Nil	5	
565	11-Jul-99	No data	No data WIB	Jawa Sea	03 52 055	113 52 05	56 No Data	PLM No Data	No Data	Sunken	Nil	Nil	
567	20-Jul-99	19:00	WID		03-25-58S	112-54-45	172	Cargo	Indonesia	Stranding	Nil	Nil	
568	03-Aug-99	03:00	WIB		03-04-30S	112-40-32	336	Tug Boat	Indonesia	Scratch of PLN Sea Cable, Jawa	Nil	Nil	
569	05-Aug-99	No data	No data	50 NM from			2 302	No Data	Indonesia	Madura Sunken	Nil	Nil	
570	06-Aug-99	01:00	WIB	Wawoni Is. No data	No data	No data	No Data	No Data	No Data	Stranding	Nil	Nil	
571	06-Aug-99	16:00	WITA		03-33-54S	124-28-50	1,505	Passenger	Indonesia	Stranding	Nil	Nil	
572	07-Aug-99	18:40	WIB		00-38-20N	101-36-45	1,377 / 75	Tanker / Tug Boat	Indonesia / Indonesia	Collision	10 / Nil	Nil / Nil	
573	08-Aug-99	01:00	WIB		03-51-00S	110-44-00	124	KLM	Indonesia	Sunken	Nil	Nil	
574	10-Aug-99	17-02	WITA	Paotere Port, Ujung	04-09-255	112-57-02	936 112, 242, 24, 27,		Indonesia	Stranding	N1I N12	1N11 23, 150, Nil,	
375	11-Aug-99	19:30	WITA	Pandang			6	KLW	indonesia	r ire	INII	32, 5	
576	14-Aug-99	00:14	WIB	Tg Perak Surabaya			1,721	Cargo	Indonesia	Sunken	Nil	186 cows	
577	19-Aug-99	10:00	No data	Putus			34	Cargo	Indonesia	Sunken	10	Nil	
578	19-Aug-99	17:30	WIT	Mouth of Kamono river, Sorong IRJA			15	Boat	Indonesia	Sunken	24	Nil	
579	29-Aug-99	05:00	WIB	Tg. Priok Port			7,969 / 2,308	Container / Container	Antigua / Indonesia	Collision	Nil / Nil	Nil / Nil	
580	01-Sep-99	06:45	WIB	200m from Somber Penyebrangan Penaiam Port			270	КМР	Indonesia	Fire	Nil	42	
581	09-Sep-99	No data	No data	Waters of Banggai	02 00 015	112 02 01	129	No Data	Indonesia	Fire	2	56	
583	09-Sep-99 09-Sep-99	19:30	WID		03-09-015 08-42-00S	115-16-50	1,286	Tanker	Singapore	Stranding	Nil	Nil	
584	09-Sep-99	10:00	WIB	No data	No data	No data	150	KM Na Data	Indonesia	Stranding	Nil	Nil	
586	20-Sep-99	03:00	No data	ig. Priok port	03-36-24S	114-27-43	3,626	Passenger	Indonesia	Stranding	Nil	Nil	
587	21-Sep-99	04:00	WIT	No data	No data	No data	145	KLM	Indonesia	Stranding	Nil	Nil	
588	22-Sep-99	21:00	WITA	Tanjug Sulamu			No Data	Cargo	No Data	Capsized	25	caws	
589	16-Oct-99	17:30	WIB	East of Coral Reef Mas, about 1NM			151	Cargo	Indonesia	Sunken	Nil	255	
590	18-Oct-99	22:15	WIB	Aru Sea, Mouth of Safan			196	КМ	Indonesia	Flooding and Sunken	416	Nil	
591	19-Oct-99	06:51	WIB		01-10-09N	103-49-05	62,031 / 85,695	Tanker / Bulk Carrier	Liberia / Panama	Collision	Nil	Nil	
592	19-Oct-99	01:00	No data		03-02-04S	113-04-03	32	KLM	Indonesia	Sunken	Nil	80	
593 594	20-Oct-99 20-Oct-99	No data	No data	No data	No data	No data	130	KM	Indonesia	Sunken	4	Nil	
595	30-Oct-99	22:15	WIB		05-52-285	105-46-04	6,186	KMP	Indonesia	Stranding	Nil	Nil	
597	02-Nov-99	16:00	WIB	Dusun Air Rame, Ipuh Village, Prop.	00-47-003	104-20-13	21	Motor Ship	Indonesia	Machine Trouble	Nil	Nil	
598	04-Nov-99	00:45	WIB	No data	No data	No data	480	Cargo	Indonesia	Stranding	Nil	Nil	
599 600	04-Nov-99 13-Nov-99	03:00 No data	WITA No data	ļ	03-03-06S 01-10-32S	114-27-04 121-20-21	No Data 26	Passenger KM	Indonesia Indonesia	Stranding Sunken	Nil Nil	Nil Fuel Oil 25	
601	18-Nov-99	10:55	WIB	No data	No data	No data	220 / 6,462	Tug Boat / Ferry	Singapore /	Collision	Nil / Nil	Nil / Nil	
602	02-Dec-99	09:30	WIB	No data	No data	No data	6,105	Passenger	Indonesia Indonesia	Fire and Sunken	Nil	Nil	
603	04-Dec-99	08:00	WIB	b/w Masa Lembo Is. And Klam Bay Ic			1,233	Cargo	Indonesia	Sunken	Nil	Nil	
604	12-Dec-99	04:32	WIB	, mu mani Ddu IS.	01-21-45N	102-09-30	3,256	Cargo	Indonesia	Flooding	Nil	Nil	
605 606	14-Dec-99 25-Dec-99	No data 11:30	No data WIR	Tg. Mesara Sea of P. Tuiub			No Data 34	PLM Cargo	Indonesia Indonesia	Sunken	3 Nil	Nil Nil	
607	28-Dec-99	22:00	LT	Sca or i . rujuli	08-28-29S	122-08-05	45	Cargo	Indonesia	Sunken	Nil	95	
608 609	28-Dec-99 04-Jan-00	No data No data	No data No data	No data Baqli Strait			346 7	Cargo Motor Shin	Indonesia Indonesia	Fire Machine Trouble	Nil	Nil Nil	
610	10-Jan-00	09:00	WIB	(Uluwatu) Cirebon Port			40	Cargo	Indonesia	Capsized	Nil	Nil	
611 612	18-Jan-00	04:30	WIB		06-47-00S	105-11-00	355	LCT	Indonesia Indonesia	Sunken Collision to Pior	1 Nil	260 Nil	
613	23-Jan-00	02:00	WITA		03-48-04S	122-31-20	15	KM	Indonesia	Sunken	7	Nil	
614	25-Jan-00	15:30	WIB	Mouth of Selam River Bangka			35	Cargo	Indonesia	Fire	Nil	Nil	
615 616	29-Jan-00 01-Feb-00	11:30 15:00	WIB WITA		05-30-00S 05-59-09S	104-37-05 105-24-04	314 148	Tug Boat Barge	Indonesia Indonesia	Propeller trouble Fire	Nil Nil	Nil Nil	
617	03-Feb-00	00:30	WIB		03-11-14S	116-11-58	60	Barge	Singapore	Collision to dersus Pertamina yang baru	Nil	500	
618	03-Feb-00	00:30	WITA		00-37-20N	107-49-59	216 + 2,136	Tug Boat + Barge	Indonesia +	Fire	Nil	Nil	
619	04-Feb-00	04:30	WIB		04-53-00S	114-47-50	1,101	Cargo	Singapore Indonesia	Sunken	Nil	940	
620	07-Feb-00	No data	No data	Belangkan Waters, 0.7 NM to west from Halang Is.			34	Cargo	No Data	Fallen to sea	1	Nil	
621	09-Feb-00	18:00	WIB	Musi River			45	Tug Boat	Singapore	Flooding	Nil	Nil	
622	11-Feb-00	02:00	WIB	Sea, 6 NM and Angin Ribut Coast			468	Barge	Indonesia	Capsized	1	800 + 1650	

No.	Date	Time	Time Zone	Location	Latitude	Longuitud e	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
623	19-Feb-00	23:45	WITA	about 3NM to east from Sanur Beach, Bali			148	Passenger	Indonesia	Fire	Nil	Nil	
624	22-Feb-00	11:00	WIB	Duii	08-04-30S	114-24-45	15,521	Tanker	Indonesia	Kapal Lalat	Nil	Nil	
625	24-Feb-00	08:00	WIB	No data	No data	No data	5,393	Cargo	Indonesia	Fire	Nil	Nil	
626	04-Mar-00	13:00	WITA		08-38-00S	120-30-31	174	Cargo	Indonesia	Flooding	Nil	Nil	
627	10-Mar-00	04:00	WIB	about 15NM to south-west from Bawean Is			168	KLM	Indonesia	Fire and Sunken	1	400 cows	
628	17-Mar-00	No data	No data	Sunda Strait			63	Cargo	Indonesia	Sunken	8	Nil	
629	18-Mar-00	21:45	WITA	Wini Port, Kab.			122	LCT	Indonesia	Sunken	Nil	Nil	
630	01-Apr-00	15:05	LT	Cilacap Waters			47,525	Tanker	Malta	Flooding	Nil	7,580 M/T Oil	
631	03-Apr-00	07:00	WITA	No data	No data	No data	75	KLM	Indonesia	Sunken	Nil	18	
632	07-Apr-00	04:30	WITA	Mouth of Pagan			3,000	Passenger	Indonesia	Stranding	Nil	Nil	
633	07-Apr-00	10:15	WIB	Leok Bay			24	Cargo	Indonesia	Capsized	Nil	Nil	
634	28-Apr-00	19:20	WIB	No. II Pier of Merak Port			6,095	Ferry	Indonesia	Collision to Pier	Nil	Nil	
635	07-May-00	10:00	WIT	Waters of Tg. Kai, Ambon Is.			198	Ferry	Indonesia	Sunken	41 dead, 4 missed	Nil	
636	13-May-00	09:00	WITA	Lombok Strait, Prop. NTB			132	KLM	Indonesia	Sunken	Nil	160cows + 14	
637	18-May-00	03:00	WIB		00-43-40N	118-06-40	34	KM	Indonesia	Sunken	Nil	Nil	
638	30-May-00	09:00	WITA	No data	No data	No data	230	Cargo	Indonesia	Sunken	14	420	
639	03-Jun-00	No data	No data	Mouth of Kendari Bay, Prop. Sulawesi Tenggala			32	КМ	Indonesia	Sunken	Nil	Nil	
640	05-Jun-00	No data	No data	TB. Estar 2			152 / 22	KM / Tug Boat	Indonesia / Honduras	Collision	1 / Nil	Nil / Nil	
641	07-Jun-00	20:07	WIB	Bali Strait			432	Passenger	Indonesia	Sunken	67	Nil	
642	10-Jun-00	07:15	WIB		00-33-41N	101-27-16	79	KM	Indonesia	Collision	Nil	Nil	
643	16-Jun-00	11:55	WITA		04-04-03S	123-15-03	1,923	KM	Indonesia	Stranding	Nil	Nil	
644	17-Jun-00	17:00	WIB		04-15-00S	106-22-30	359	KM	Indonesia	Sunken	Nil	379	
645	18-Jun-00	11:00	WIB	about 40NM from Laut Kangoan			382	KM	Indonesia	Sunken	14	500	
646	22-Jun-00	06-15	WIB	Nabire Pier, Irian Jaya			3,260	KM	Indonesia	Collision to Pier	Nil	Nil	
647	27-Jun-00	No data	No data		05-17-03S	106-45-10	370	Barge	Indonesia	Sunken	Nil	Nil	
648	29-Jun-00	08:40	WIT		02-34-04N	126-10-00	426	KM	Indonesia	Sunken	522	35	
649	05-Jul-00	02:00	WIB	Cinta Selatan Sea, 40 NM from			76	KM	Indonesia	Sunken	Nil	35	
650	09-Jul-00	11:00	WIB		00-31-04S	102-48-16	101	Tug Boat	Indonesia	Sunken	Nil	Nil	
651	17-Jul-00	No data	No data		05-40-02S	102-51-06	789	KM	Indonesia	Sunken	Nil	Nil	
652	20-Jul-00	10:45	WIB		03-06-065	113-04-06	2,718	Passenger	Indonesia	Sunken	Nil	Nil	
653	24-Jul-00	09:45	WIB		01-07-04N	103-46-03	16,683	Bulk Carrier	Turkey	Unknown	Nil	Nil	
654	25-Jul-00	08:12	WIB		07-46-095	109-10-05	/18	Tanker	Indonesia	Flooding	INII	990	Aspai
655	30-Jul-00	02:25	WIB	Siantar			101	LCT	Indonesia	Sunken	Nil	100	
656	21-Aug-00	14:00	WIB	Samudera Fishing Industries			157	Fishing Boat	Indonesia	Fire	Nil	Nil	
657	01-Sep-00	22:00	WIT		03-33-44S	127-17-00	118	KLM	Indonesia	Drifting	Nil	Nil	
658	01-Sep-00	07:25	WIB	Penyebrangan Merak port			6,186	Ferry	Indonesia	Collision	Nil	Nil	
659	19-Sep-00	02:00	LT		12-16-45S	106-18-16	1,171	Cargo	Indonesia	Sunken	Nil	1,446	
660	20-Sep-00	05:55	WIB		01-29-27S	104-40-35	770	KM	Indonesia	Collision	Nil	Nil	
661	23-Sep-00	17:40	WIB	Coast of North direction of Gresik Port			676	KM	Indonesia	Stranding	Nil	Nil	
662	04-Nov-00	10:45	WIB	The most end of selatan of Matasui			480	KM	Indonesia	Stranding	Nil	Nil	
663	04-Nov-00	14:15	WIB	Batanghari River			34	KM	Indonesia	Fire	Nil	10	
664	01-Dec-00	01:30	LT		05-16-10N	107-07-35	444	KM	Indonesia	Sunken	Nil	496	
665	02-Dec-00	09:15	WIB	7 NM from ADPEL Geresik			173	KM	Indonesia	Sunken	Nil	300	
666	16-Dec-00	05:00	WIB	Waters of Tanjung Karas, Samarinda			125	KM	Indonesia	Sunken	18	Nil	
667	16-Dec-00	10:30	WIB	Perawang Special Pier			722	KM	Indonesia	Sunken	Nil	448	

NO	DATE	PLACE	NAME	TUDE	ABOUT SHIP	FROM	TO	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
1	Jan 15,1990	Madura Island, on the	MINASA MULIA	Wooden ship	SIZE	Kalimas Pier,	Banjarmasin	Burned & Sank	9 survived out of, 7 peoples	
2	Ion 15 1000	north beach Malacca Strait		Woodon shin		Surabaya Ta Priok	Relowon	Sank	missed	
~	5411 10,1550	Malacca Strate	MAJO INDAII	wooden snip		ig. i nok	Delawan	Baik	in the sea for 7 hours	
3	Jan 15,1990	Jaga Island, Thousand Islands	BATAM JAYA	General Cargo ship		Sunda Kelapa Port	Batam	Sank	70 alive & 9 missed	
4	Jan 20,1990	Banyak Island	SINAR MAKMUR		weight 20				there's 36 crews, 13 missed	
5	Jan 22,1990	Maxus Island, on the	LAN SHUI	Tanker	ton			Fire in the engine room		the ship was loaded with
6	Ian 24 1990	thousand Islands Indonesia Sea		General Cargo					50 missed	168.000 barrel oil
	Juli 21,1000			ship						
7	Jan 27,1990	Jambi	MAJU INDAH	Passenger ship		Palembang	Jambi	the ship was battered by hurricane & sank	7 dead	
8	Jan 31,1990	Merauke	MRICA	General Cargo				Sank	27 crews survived out,1	
9	Peb 27,1990	Pemali river, Brebes		Canoe		Desa Pesantunan	Desa Kaliwlingi	the ship was overloaded &	2 dead, 10 missed	
10	Mar 9.1990	Jakarta Bay	METRO	General Cargo		Sunda Kelapa Port	Bangka	upside down the ship was water leak &	13 alive	
11	17 1000	Poster Con North		ship		P Pt	Dalama 0	upside down	r had o mine d from 04	
11	Mar 17,1990	Sulawesi	DATA ABADI	MOLOF BOAL	ton	Bau Bau Port	Rumbia	hurricane & sank	passengers	
12	Apr 10,1990	Toli toli,Center Sulawesi	MAKTO JAYA	Tanker		Toli toli	Buol	Exploded	2 died, 2 burn injured	
13	May 1,1990	Pariaman	KARYA PUTRA	Fishery ship		Naras Sea	Kasiak Island	the ship was upside down	8 died,18 missed, from 35	
14	May 10,1990	Tanjung Alang	SYANE II	Motor Boat	40 ton,	Ambon Port	Leksula Maluku	& Sank the ship was battered by	passengers 13 dead	
	-				97.87m ³		Tengah	waves & winds & upside		
15	May 17,1990	Tanjung Tambo Aye	SIAPY R-1	Steamship	25.47m X	Singapura	Afrika	Sank	16 missed	
					4.80m X 2.30m					
16	May 18,1990	Mukek South Aceh	DAYAH SEMUT	General Cargo		Sinabang, Aceh	Sibolga,North	Sank	20 cows missed	
17	May 22,1990	Tanjung Aus	САНАҮА	Ship Motor Boat	99.33m ³	Nunukan	Tarakan (East	Sank	76 dead	
18	May 29,1990	Siak River PekanBaru	MACOLLE CAHAYA MURNI	Motor Boət		PekanBaru	Kalimantan) Tg. Pinang	Hit off the barge & sank		
*	May 28,1990	u					oo			
19	July 18,1990	Kahayan River,Kapuas		Motor Boat				Sank	1 dead, 2 injured	
20	July 26 1000	Palangkaraya Tg Ricardo, Batam	АНА	Barge			Belawan	Sank		the shin was loaded with
20	July 20,1990	island	лиа	Darge			Delawali	Saik		1200 ton scrap iron
21	July 29,1990	Sorong, Orbinasopen Sea	SUPRA I					Burned & Sank		
22	July 31,1990	Biaro island, Sangihe	ALASKA	Wooden ship	215m ³	Bitung	Litung Port,	Burned & Sank	2 dead,25 missed, 44 alive	
23	Aug 4,1990	Cilacap	ALKASA TRIMA JAYA	Fishery Ship		Sen Tolokawat	Salibabu island	the ship were swallowed	3 dead,4 injured	the engine was broken
24	Aug 16 1990	Tanjung Santan	NACA SATU	Motorboat &				by the waves Burned	3 dead	by waters the fire came from Naga
~1	Aug 10,1000	sea,East Kalimantan	UNION TIMUR,	speedboat				Burnea	5 ucau	Satu Ship
25	Aug,1990	Madura Strait	RETLANA GADING	Sail boat	6 x 3 m	Baucemara	Dungkok	the ship was overloaded	3 missed	
26	Aug 31,1990	Mahakam river	YANMAR F	Motor Boat	3 x 8 m	Sunda Kalana Bant	Iomhi	Burned & Sank	2 injured	
21	Sep 3,1990	islands	KAHASIA JATA	MOLOF BOAL	300 1011	Sunda Kelapa Port	Janibi	tornado & sank	z misseu	
28	Sept 9,1990	Between Leksula Port & Fogi Port	SINAR LAUT	Motor Boat		Leksula Island	Fogi Port	Hit the coral & sank	5 missed,18 alive	
29	Dec 3,1990	Between Sorong &	NUMARAI	Motor Boat	900 ton	Sorong	Mandiwari	the engine was broken &	300 passengers was washed	
		Mandiwari						the ship was washed away	away	
30	Jan 17,1990	Between Karimun	MAJU	Trolling Ship	15 ton	Karimun Jawa	Tg. Pinang	the engine was broken &		
		Jawa & Ig. Finang						the ship was washed away		
31	Feb 4,1991	Between Gresik Port & Bawean Island	PINISI WISATA	Sail boat	372 ton	Gresik Port	Bawean Island	the ship was water leak & sank	200 alive	
32	Feb 14,1991	East Seram sea	DHARMA	Motor Boat	28.41m ³	Ambon island	Ambalau	the engine was broken &	13 alive	
			WANCI					the ship was washed away		
33 *	Feb 14,1991	Malacca Strait	HIDUP KEMBALI	Motor Boat	2.5 ton	Kuala Langsa	Telaga Tujoh, East Aceb	Sank	17 dead, 10 missed, 26 alive	
34	Feb 17,1991	Omazaki, Jepang	INDO BARUNA II	General Cargo ship	6.148 ton	Pohang Port,South Korea	Funabashi Port	the ship was battered by huge hurricane & foul	4 dead, others missed from 23 crews	
95	Esh 10 1001	Patroan Palik Banan 9	DENCAS	•		Polik Donon	Inhanta	weather	4 minued 14 in bosnital	
- 35	1.60 19,1991	Jakarta	DENGKLOK			Банк Гаран	Jakaita	huge waves & winds	4 missed,14 m nospital	
36	Feb 23,1991	on Nusa Penida	SEGARA WINDU					the ship was battered by huge waves & unside	8 dead	
07	E 1 00 1001	8	4004	G 411		D	a 1	down		
37	Feb 23,1991 Feb 27,1991	Between DaboSingkep	PANAMA RAYA	San DOat	30 ton	Dabo Singkep	Jambi	the ship was water leak &	5 deead, 9 missed	
39	Feb 27,1991	& Jambi On the rumen of		Canoe				sank the canoe was water leak	7 dead	
40	Man 0 1001	Jatiluhur	KETADANC TI	Fisher D	20 kc	Dention -1-	Noture C.	& sank		
40	wiar 2,1991	Natuna Sea	KE I APANG IV	r isnery Boat	30 1011	гонцалак	ivatuna Sea			
41 42	Mar 15,1991 Mar 19,1991	Tg Perak Port	MAJU JAYA ARMADA		7 ton			Sank the mail bag on the ship	5 dead,4 missed,4 rescued	the ship was docked in
40	Man 00 100	Dataman W-1-1-1-1-0	PERMAI	Maton D :	15.9 ****	the environment of	Kalah 91 -	was burned	17 minored	Tg. Perak port
43	war 20,1991	Detween Kalabahi & Kateb	ΠΑΚΙΑ YUDHA	MOTOR BOat	13.3 ton	me capital city of Kalabahi	raied village	foul weather & overloaded	1 / missed	
44	Mar 26,1991		HENRISON	tugboat	30 ton			the ship was shipwreck & sank	5 dead,1 missed	
45	April 1,1991	Cocos Island	KARTIKA	Trolling Ship	length 33m		1	the ship was battered by	the ship & 21 crews missed	
46	April 19,1991	Brebes	SETIA KAWAN	Canoe	11 x 2.5 m &	Penanggapan	Malahayu	Errol's hurricane the ship was upside down	66 dead	
					weight 2.5	village	Village	cause overloaded		
47	April	Between Muara Sida &	WIRA BANA	Motor Boat	11 x 2.5 m,	Muara Sida	Liwungan Island	the ship was water leak &	24 dead	
48	20,1991 April	Liwungan Island	IRIANA II	Tugboat	2.5 ton			sank	6 dead	
	23,1991	T				Teleslaut	Denter 17	ah		
49	April 25,1991	Jepara	NUR ANIS	Canoe		Jobokuto	ranjang island	tne canoe was battered by huge waves & sank	z aead, z in hospital	
50	April 29.1001	On the rumen of	SETIA KAWAN &	Canoe				the canoe was over loaded	65 dead	
	£9,1991	watanayu	DALEBAI JAYA					a upside down		
51	May 6,1991 May 1.1991	Banda Sea	TUNAS	Motor Boat	weight 90 ton	Biringkasi, Ujung Pandang	Namlea, Maluku	the ship was battered by huge waves & winds	all crew missed	
52	May 10,1991	Kapuas sea	TITIAN JAYA &	General Cargo		6		because of foggy &	2 died,11 missed,6 alive	
53	May 14,1991	Madura Island	TRI ARTA	Motor Boat	280 ton	Surabaya	Sampit	the ship was hit the	6 alive,12 missed	
*	May 15,1991							barge,leak & sank	no victims	
54	May,1991	Alor	BARAKA AMAL	Sail boat	8 ton	Pantar Island		the ship was battered by	the captain & 7 crews alive	
55	May 22,1991	Between Pontianak &	ABADI JAYA &	Sail boat		Pontianak	Sunda Kelapa	nurricane & sank Sank		
		Sunda Kelapa Port	MILIAS				port	l		

NO	DATE	PLACE	NAME	TVPF	ABOUT SHIP	FROM	то	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
56	May,1991	On the Karimun Java	GUNUNG PRIMA	Motor Boat	SILE	Pontianak	Sunda Kelapa	the ship was water leak &		
57	Jun 4.1991	Malacca Strait	SURYA BAROH	Motor Boat	25 ton	Kuala Langsa	port	sank the waves rammed into	2 crews injured	
50	1	Court Doot		C			V	the ship	5 da a d 4 andrea d 6 ann 07	
58	Jun 16,1991	Serel Port		Canoe			Kampung Balajeng	rammed into the sea	5 dead,4 missed from 27 passengers	
59	Jun 26,1991	Malacca Strait		Barge		Batu Pahat, Johor Malaysia	Riau	Hit by tanker & sank	76 alive, 3 dead from 120	
60	Jun 28,1991	Siak river	TARIDA	Motor Boat		PekanBaru	Batam	Collided with a tanker	1 dead,11 alive	
*	Jun 28,1992		TARIDA & DOVENCHEN I					(from Singapura to Perawang Sea)		
	1 1 0 4004			C UD .			W 1 1			
61	July 3,1991 July 3,1991	Malacca Strait	KOTA LIA	Tugboat	0.4 ton	Salabangka	Kendari	Collided with the tanker	3 alive,7 missed	
*	July 1991	Indramaya Waters	KATELIA	TugBoat		Tenal	Jakarta	the chin was battered by	6 missed	
05	5uly,1551	indrainayu waters	ANUGRATIELMA	rugboat		Ocean,Center Java	Jakarta	huge waves & upside	5 anve, 1 missed	
64	Julv.1991	Makassar strait	SUMBER HIDUP	SailBoat	50 ton	Samarinda Port	Makassar	down the ship was shaterred by	12 rescued	
0.5	1 1 0 4004	D 1						hurricane	a) 16 40	
66	July 6,1991 July 7,1991	Makassar strait	HURRIYAH	Motor Boat Motor Boat	20 ton	Wani port	Banjarmasin	Upside down ship & Sank	4 missed, 3 alive	
67	Aug 15,1991	Bengalon Sea,Kutai	KLINJAU PERMAI	Motor Boat		Sangkulirang	Samarinda	Leak & Sank	2 missed,36 alive	
68	Sept 10,1991	Madura Strait	MUSTIKA	Motor Boat		the quay of Raas	Jangkar	Overloaded & sank	5 dead,15 missed,42 alive	
69	Sept 14,1991	Musi River	INDAH	Pioner Ship &			Situbondo Port	the two ships was collided,	1 dead,2 missed from 23	
			SEMPURNA	Motor Boat	2 x 6 m			caused by the foggy	passengers	
70	Sept 26,1991	Musi River	Pinggang	TraderShip &				because of foggy &		
			Anjasmoro, Pormino 20 Niogo	Tugboat				weather foul		
			53,Selat Bangka,							
71	Oct 8.1991	Musi River	Mawar	Speedboat	20			the two ships was collided	3 dead	
1					horsepower			caused by the foggy		
72	Oct 6,1991	North Sulawesi		Motor Boat		Molibago port			3 dead	
73	Oct 17,1991	Kariyungan Besar	SUMBER	Landing Beach		Batu Putih Village	Samarinda	the ship strucked the pole	2 missed,13 alive	
		isianu, perau	IIANAFAN MAJU	Crait				a sain		
74	Oct 31,1991	Bengkulu sea	CHANDRA KIRANA	Motor Boat	6000 DWT	Sibolga,North Sumatera	Banjarmasin,Sou th Kalimantan			
75	Dec 10,1991	Malacca Strait	LAILA	Ferry		Panjang strait port	Batam island	the ship was battered by	2 missed	
76	Dec,1991	East Kalimantan	BEAUTIFUL	Motor Boat				huge waves & sank the ship went aground	2 missed	Philipines's ship
	D 1001	Postor a Con	GIRL	C II t		Course the	Tallant	de de martener des	10 1 - 1 6 04	1
77	Dec,1991	Bontang Sea	REMAJA	Speedboat		Sangatta Subdistrict	1g. Laut	the ship was battered by huge waves & upside	12 dead from 34 passengers	
78	Dec 11 1991	Sahu Sea	CITRA I	Motor Boat	400 top	Kupang	Wainganu Fast	down Sank	3 dead	
/0	Dec 11,1331	Sabu Sca		Motor Boat	400 1011	Rupang	Sumba	Bank	5 ucau	
79 80	Jan 23,1992 Feb 7.1992	Tg.Pasai sea, Riau Oransbari	TANJUNG SARI JABAL NUR	Ferry Motor Boat		Tg. Batu	Batam	Burned & Sank Burned & Sank	7 dead 2 missed	
81	Feb 12,1992	East side of Sumatera	OCEAN PEARL	Tourist Boat	12.356 DWT	Singapura	Tg. Priok	Burned		
82	Mar 3,1992	Shipbuilding	KURNIA-6	Fishery ship	1,200 ton	1g.PT10K	Batam	Burned	4 seriously injured,12 minor	
84	Mar 4 1992	Batang Hari riyar		(shrimp) Ferry	40 top	Iamhi	Kuala Tungkal	Sank	injury 17 dead	
85	Mar 11,1992	Bangka Strait	ARMADA	Motor Boat &	696 GRT	Tg. Priok	Ruala Tungkai	Crashed	17 ucau	
*			MULIA &	Tanker						
			PERBAYAN Purbayan							
86 87	Mar 11,1992 Mar 16 1992	Rawa Kalimati Samak Riau Sea		Canoe Wooden shin		Ta Bakau	Malauria	Crashed & Sank	3 dead 10 dead 5 missed	
07	Wai 10,1552	Samak kiau Sca		wooden snip		Bengkalis	walaysia	Bank	To ucau,5 misseu	
88 89	May 7,1992 May 15,1992	Tg.Balai Sea,Riau Ujung Genting	PULAU INDAH	Speedboat Motor Boat			Malaysia	Sank Collided with a tanker	17 missed,2 alive 9 missed	
00	May 17 1009	Sea,Sukabumi Tahatan Villaga Banita	MAC MULTA	Matan Baat		Banianmaain	Bonito	Promo ed	7 daad 9 missad 9 aanianah	
90	May 17,1992	Kuala	MAS MULIA	Motor Boat		Banjarmasin	Barito	Burned	injured, 4 minor injury	
91	Jun 2 1992	Between village of	KEMILAU	Motor Boat		village of Keramat	Sekura Sambas	Sank	18 dead 2 missed 4 injured	
01	5411 2,1002	Keramat Bay & Sekura		Motor Bout		Bay	Senara Sambas	Built	ro ucuu, 2 misseu, r mjurcu	
1		Sambas								
92	Jun 20,1992	Kelang Port	CHOON HONG	Tanker	650 metric			Crashed	13 missed,8 dead	
02	I 80 1000	Chinhuil Marson P. P. 1	III	Tonker	ton			Promod	9 daad	
93 94	Jun 28,1992	Sekala Island Sea	LOMBOK	SailBoat	50 m ³	Labuhan, Lombok	East Kalimantan	Sank	64 missed,5 dead	
* 95	July 5 1002	Karang Jamuang	UTAMA BUDI MUDNU 9	SailBoat &	402 m ³ 0	Gresik Port &	Bawean &	Crashed & Sank	27 dead 30 dead, 16 missed	
*		Sea,Gresik	TJIPTA	Motor Boat	825.67 m ³	Banjarmasin	Surabaya		4 dead, 7 missed	
06	July 8 1009	Bawean Beach	RAHARDJA MERLIN	General Cargo	497 10 - 3	Gresik	Bawean	Sank	16 missed	
30	5 uly 0,1992			ship	461.12 m ⁻	GICOIR	Sawcan		10 miloseu	
97 *	July 16,1992	Sunda Kelapa Port	PULAU BALI &	Motor Boat				Burned		
00			SINAR BALL							
90 *	July 16 1009	North Journa	SINAR BALI PULAU BALI	Weeden akin				Sault	4 minored	
	July 16,1992	North Jayapura Offshore	SINAR BALI PULAU BALI SUMBER HIDUP BARU	Wooden ship				Sank	4 missed 1 dead,3 missed	
	July 16,1992	North Jayapura Offshore	SINAR BALI PULAU BALI SUMBER HIDUP BARU Sumber Hidup Baru	Wooden ship				Sank	4 missed 1 dead,3 missed	
99	July 16,1992 July 27,1992	North Jayapura Offshore the northest beach of	SINAR BALI PULAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I	Wooden ship Canoe				Sank	4 missed 1 dead,3 missed 3 dead	
99 100	July 16,1992 July 27,1992 Aug 1.1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea	SINAR BALI PULAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY	Wooden ship Canoe Motor Boat				Sank Sank Sank	4 missed 1 dead,3 missed 3 dead 14 missed	
99 100 101	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river,	SINAR BALI PULAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR	Wooden ship Canoe Motor Boat airplane cessna-			Kelansam &	Sank Sank Sank Crashed	4 missed 1 dead,3 missed 3 dead 14 missed 1 dead	
99 100 101	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak	SINAR BALI PULAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat			Kelansam & Nangaela	Sank Sank Sank Crashed	4 missed 1 dead,3 missed 3 dead 14 missed 1 dead	
99 100 101 102 102	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okabo Pice	SINAR BALI PULAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASUPO	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat		Tegal Okaba Piar	Kelansam & Nangaela Cirebon Merauke	Sank Sank Crashed Collided with a tanker Sank	4 missed 1 dead,3 missed 3 dead 14 missed 1 dead 2 missed,2 injured 1 dead	
99 100 101 102 103	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat		Tegal Okaba Pier	Kelansam & Nangaela Cirebon Merauke	Sank Sank Crashed Collided with a tanker Sank	4 missed 1 dead,3 missed 3 dead 14 missed 1 dead 2 missed,2 injured 11 dead,1 missed	
99 100 101 102 103 104	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992 Aug,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke Tg. Perak Port	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI MV HOEGH DUKE	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat Container Ship	42000 ton.197 x 36	Tegal Okaba Pier	Kelansam & Nangaela Cirebon Merauke	Sank Sank Crashed Collided with a tanker Sank 5 dead,6 injured,1 missed	4 missed 1 dead, 3 missed 3 dead 14 missed 1 dead 2 missed, 2 injured 11 dead, 1 missed they were on a rescue training	
99 100 101 102 103 104	July 16,1992 July 27,1992 Aug 1,1992 Aug 1,1992 Aug 14,1992 Aug 14,1992 Aug 1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke Tg. Perak Port	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI MV HOEGH DUKE	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat Container Ship	42000 ton,197 x 36 m	Tegal Okaba Pier	Kelansam & Nangaela Cirebon Merauke	Sank Sank Crashed Collided with a tanker Sank 5 dead,6 injured,1 missed	4 missed 1 dead, 3 missed 3 dead 14 missed 1 dead 2 missed, 2 injured 11 dead, 1 missed they were on a rescue training	
99 100 101 102 103 104 105 106	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992 Aug,1992 Aug,1992 Aug 30,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke Tg. Perak Port Cirebon Waters Puger Jember	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI MV HOEGH DUKE SUKAMAJU	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat Container Ship Motor Boat	42000 ton, 197 x 36 m 19 pk	Tegal Okaba Pier	Kelansam & Nangaela Cirebon Merauke	Sank Sank Crashed Collided with a tanker Sank 5 dead,6 injured,1 missed Sank Sank	4 missed 1 dead, 3 missed 3 dead 14 missed 1 dead 2 missed, 2 injured 11 dead, 1 missed they were on a rescue training 3 dead, 2 missed	
99 100 101 102 103 104 105 106 107 108	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992 Aug,1992 Aug,1992 Aug,1992 Sep 9,1992 Sep 13,1002	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke Tg. Perak Port Cirebon Waters Puger Jember the rumen of Cachaba	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI MV HOEGH DUKE SUKAMAJU	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat Container Ship Motor Boat Canoe Navy Ship	42000 ton,197 x 36 m 19 pk 38 x 10 4 m	Tegal Okaba Pier Surabava	Kelansam & Nangaela Cirebon Merauke	Sank Sank Crashed Collided with a tanker Sank 5 dead,6 injured,1 missed Sank Sank Sank Sank	4 missed 1 dead, 3 missed 3 dead 14 missed 1 dead 2 missed, 2 injured 11 dead, 1 missed they were on a rescue training 3 dead, 2 missed 2 dead 2 dead 2 dead 1 dead 22 alive	
99 100 101 102 103 104 105 106 107 108	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992 Aug,1992 Aug,1992 Sep 9,1992 Sep 13,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke Tg. Perak Port Cirebon Waters Puger Jember the rumen of Cacaban North side of Celukan Bawang Sea	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI MV HOEGH DUKE SUKAMAJU AMURANG	Wooden ship Canoe Motor Boat airplane cessna- 185 & motor boat Canoe Sail Boat Container Ship Motor Boat Canoe Navy Ship (KRI)	42000 ton,197 x 36 m 19 pk 3.8 x 10.4 m, 488.42 ton, 8	Tegal Okaba Pier Surabaya	Kelansam & Nangaela Cirebon Merauke Nusa Tenggara Barat	Sank Sank Crashed Collided with a tanker Sank 5 dead,6 injured,1 missed Sank Sank Sank Sank Sank	4 missed 1 dead, 3 missed 3 dead 14 missed 1 dead 2 missed, 2 injured 11 dead, 1 missed 11 dead, 1 missed they were on a rescue training 3 dead, 2 missed 2 dead 13 missed, 1 dead, 22 alive	
99 100 101 102 103 104 105 106 107 108 109	July 16,1992 July 27,1992 Aug 1,1992 Aug 5,1992 Aug 14,1992 Aug 14,1992 Aug 1992 Aug,1992 Aug 30,1992 Sep 9,1992 Sep 13,1992 Sep 19,1992	North Jayapura Offshore the northest beach of Java Island Sorong Sea Kapuas river, Pontianak Cirebon Sea Between Okaba Pier and Merauke Tg, Perak Port Cirebon Waters Puger Jenber the rumen of Cacaban North side of Celukan Bawang Sea Ternate	SINAR BALI PUTAU BALI SUMBER HIDUP BARU Sumber Hidup Baru I GLORY SINAR MAKMUR UTAMA JAYA WASURO BONTANGI MV HOEGH DUKE SUKAMAJU AMURANG MALINDA	Wooden ship Canoe Motor Boat airplane cessna 185 & motor boat Canoe Sail Boat Container Ship Motor Boat Canoe Navy Ship (KRI) Motor Boat	42000 ton,197 x 36 m 19 pk 3.8 x 10.4 m, 488.42 ton, 8 knot 90 ton	Tegal Okaba Pier Surabaya Ternate	Kelansam & Nangaela Cirebon Merauke Nusa Tenggara Barat	Sank Sank Crashed Collided with a tanker Sank 5 dead,6 injured,1 missed Sank Sank Sank Sank Sank	4 missed 1 dead, 3 missed 3 dead 14 missed 1 dead 2 missed, 2 injured 11 dead, 1 missed 11 dead, 1 missed they were on a rescue training 3 dead, 2 missed 2 dead 13 missed, 1 dead, 22 alive	

NO	DATE	PLACE	NAME	TVDE	ABOUT SHIP	EROM	TO	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
110	Sept,1992	Malaka Strait	NAGASAKI	Tanker &	SILE	Arab	Brunei	Crashed & Burned	16 dead,45 missed	
			SPIRIT & OCEAN	Container Ship			Darussalam			
111	Sen 1992	Bandulu Anver Beach	STAR OF THE					the shin was unside down		
	5cp,1002	Bundund, Filiyer Beden	WEST					the ship was applae down		
	0.1000		CRIAD LOLODA							
112	Oct,1992	Dodahe Beach	SINAR LOLODA	Motor Boat	20 ton		Ternate	Sank		
113	Oct 16,1992	Barito river	BUKIT TINGGI	Motor Boat		Banjarmasin Port	Surabaya	Crashed		
Ť			Permasan							
114	Oct 30,1992	Karimata Strait	PUTERA	Motor Boat		Wanci Port	Cirebon Port	the ship was shaterred by	11 missed, 5 rescued	
115	Sept 7,1992	Ulee Lheue Beach	SENATIASA	Motor Boat		Ulee Lheue Port	Bunta Island	Sank	4 dead	
116	Nov 7,1992	Air Batu Ampar Bay	KURNIA JAYA, FAJAR BARU	Motor Boat						
			BERKAT USAHA							
117	Nov,1992	On the special Pier of Santa Fe	VULKANIK, WIRA	Tourist Boat	7 x 4 m & 11 x 4.5 m &			Burned	3 dead	
			BUSINESS,		11 x 4.5 m					
118	Nov 1992	I ahuan Island	COMPANY	SpeedBoot	500 pk			Burned	5 dead 4 burned injured	
110	1407,1552	Labuan Island	EXPRESS II	Specuboat	500 pK			Durneu	5 dead,4 barned injured	
119	Dec 2,1992	Between Atapupu Port & Surabava	SABANG RAYA	Motor Boat	300 ton / DWT	Atatapu Port	Surabaya	Burned	2 dead,5 missed	
120	Dec 8,1992		BITANAH	TugBoat			a 1	Sank	1 dead,1 missed,11 alive	
121	Dec 26,1992	Madura Strait	MELINA	Motor Boat	3230 DW1, 93.8 m	Jakarta	Surabaya	Crashed	40 missed	
122	Dec 26,1992	Madura Strait	FENWINI WINI I	Motor Boat		Gresik	Bawean	Crashed	10 missed,21 injured,14	
			Melina						4 dead,3 passenger & 3 crews	
123	Ian 21 1993	Andaman Sea Aceb	MAFRSK	Tanker	255 312 ton	Oman	Janan	Crashed	missed	
120	5411 21,1000	, indunian bedi, item	NAVIGATOR &	- uniter	& 96,545 ton	omun	Supan	Crushed		
			SANKO HONOUR							
124	Jan 29,1993	Jakarta Bay	RAHMAT ILLAHI	Motor Boat	249.23 m ³	Lumpur River	Kalibaru North	Sank		
125	Jan 29,1993	Sungai Puteri Sea	LIBERTY I	Motor Boat		Sumatera	Jakarta	Sank	16 missed, 17 injured	
*	Ann 12 1002	Pangaman Cala			19 n 1 75 m	Mlatan Villaga	Mala Villara	Sault	9 missed	
120	Apr 12,1993 Apr 14,1993	Buru Sea	CAHAYA	Motor Boat	15 x 1.75 III	Tomia, Eastern	Temilia,	Sank	4 rescued, 12 missed	
128	Apr 19 1993	Ta Emas Pier	MADINAH KURNIA DEWI	Ceperal Cargo	2250 top	Sulawesi	IrianJaya Ta Emas	Burned		
120	мрі 19,1993	rg.Emas r iei	KORIVIA DEWI	ship	103 m		rg. Einas	Builleu		
129	Apr,1993 Apr 29,1993	Situbondo Tg. Padang	PEYLIN	Ferry Motor Boat			Ani-Ani Village	Sank Crashed	1 dead 127 alive, 2 dead, 21 missed	
		Sea,Bengkalis								
131	Apr,1993	Lombok Strait	BINA GORA	Motor Boat				Sank		
132	May 6,1993	Batu Putih River		Wooden ship		Desah village	Torjun	Sank	7 alive,8 dead,1 missed	
133	Jun 7,1993	Between Batu Ceper &		Motor Boat	12 m x 2 m	Batu Ceper &	Untung, Java	the ship was overloaded &	3 dead, 16 seriously injured	
134	Jun 28 1993	Untung, Java Island Jangkar Port	KOLAKA	Passenger shin		Naga Bay	Island	upside down Sank	1 crew dead	
*	Apr 20,1993	bunghai i ore	nolanut	r ussenger sinp				Sum	r trew utua	
135	Jun 13.1993	Nusakambangan	MITRA SEJATI	Motor Boat		Sentolo Pier		the ship was battered by		
100	L.b. 00 1000	Ta Bata Gas Fast		Matan David				hurricane & sank	1	
130	July 28,1993	Tg. Batu Sea, East Kalimantan	& CAHAYA	Motor Boat				Crashed	1 missed,4 died from Kurnia Utama's passenger	
127	Aug 11 1002	Potwoon To Dinang &	AKBAR III			Ta Dinona	Kuala Tungkal	the chin was battered by	5 dead 11 microd	
157	Aug 11,1000	Kuala Tungkal	TORTO INDAIL			rg. r mang	Ruala Tuligkai	huge waves & strong	5 dead, 11 missed	
138	Aug 13,1993	Eastern Sulawesi	WALIO INDI III	Motor Boat	98 23 m ³	Luwuk. SouthEast	Kendari	winds	6 dead.24 missed.60 alive	
					34.67 ton	Sulawesi				
139	Aug 13,1993	Between Benoa Port & Movo Port	BLUE MOON	Tourist Boat		Benoa Port	Moyo Islands	the ship was hit the coral & leak & sank	5 alive	
140	Aug 20,1993	Near by Gili Genteng	BUNGA BANGSA	SailBoat		Port of Gili	Tg.Sumenep	Tossed	13 dead, 10 missed, 14 alive	
141	Aug 21,1993	Island Siak River		Dugout		Genteng Island	Quay	the ship was battered by	5 in hospital, 3 dead	
149	Aug 91 1009	Ionono Iolond	DEWA DARU	-		Konimun Jouro	Isnana	hurricane		
142	ring \$1,1993	separa islallu	DEWA DARU			isai inidii JaWa	separa	the ship	oo passenger are rescued	<u> </u>
143	Aug 24,1993	Sea of Bawean Island	ARNATA			Tg.Perak Port, Surabaya	Banjarmasin	the waves rammed into the ship	all crew & 26 passenger are rescued	
144	Aug 24,1993	Around Terowongan	SARI MULYA	Fishery Boat		Terowongan		the waves rammed into	1 alive,4 missed	i
145	Aug 31,1993	Musi River	NB AZIM JAYA			village Quay		Sank	5 dead	
146	Sept 18,1993	Around of Ambon Sea	KALULIS	Canoe	6.5 m x 2.5	Tual,Ambon	Yamtel Village,	Sank	14 passenger are missed	
147	Oct 13,1993	Karimun Jawa Sea	TONGKOL IV	Motor Boat	8 m	Karimun Jawa	Jepara	1	16 dead, 18 missed, 46 alive	1
*	Oct 11,1994								26 dead,9 missed	1
148	Oct 27,1993	Around of Bayur Bay	MN MUTIARA	Motor	6000 DWT	Kalianget Madura	Bayur Bay,	Lost probably sank	25 crew are missed	
149	Dec 8,1993	Sea Indian Ocean	PASIFIC I MAKMU	Boat(salt)	5 GT	Port	Padang	Lost		
	D 10 1	A	BESARE			Fort W. 1	I	Therefore a state	14 Jul 1	
150	Dec 18,1993	Around of East Waiwerang Sea	MN WATAN WATUHARI		16 m [°] , 4 ton	East Waiwerang	Lamakera, East Solor	Upside down ship	14 dead, 1 missed, 47 alive	
151	Dec 31,1993	Around of Ayu Island	DIAN INDAH			Ayu Island	Kaledupa Island	Lost	6 crew are missed	
152 153	Jan 3,1994 Jan 15,1994	Around of Manado sea Balikpapan Sea	MUTIARA JAYA	Motor Boat Motor Boat		Manado Kampung Baru	Bunaken Salisingan	Snip Upside Down Burned & Sank	1 dead,2 missed,18 alive all crew rescued	
		•••	III			Port, Balikpapan	Island, Makassar			
154	Jan 18,1994	Bengawan Solo river		Pioner Ship		Plupuh village	Stratt Kembangan	Ship Upside Down	14 passenger are missed	
155	Ian 26 1004	Southest China Soa	COSMOS	-	15 749 top		Village	Burned	9 crew from Indonesia	
133	5an 20,1994	Sequicar Chinid Sea	200100		10,746 1011				missed	<u> </u>
156 *	Feb 3,1994 Jan 1 1994	Tg. Perak Port	YITROS	Motor Boat				Burned & Sank	17 cars	
157	Feb 7,1994	Mahakam river	KOMPAS	Motor Boat		Pasar pagi Pier,	Mangkujenang,	Crashed & Sank	4 missed,16 alive	
158	Feb 10,1994	Bekasi river	WAHYU III	Pioner Ship	1.5 x 5 m	Samarinda	Paalasan	Ship Upside Down	4 dead,11 missed	
159	Mar 24,1994	Selopeng Beach	CANTALIA	Canoe		Done Done	Numular Ford	Ship Upside Down	3 kids dead	
160	wiar 28,1994	mound of Sulawest Sea	SUPER			r are-r are	Kalimantan	floating for 3 days		<u> </u>
161 *	Mar 8,1994	On the Flores sea of	ALKIAT	Motor Boat				the ship was battered by		the ship was rescued by
162	Apr 21,1994	Between Ketapang &	KALTIM MAS II	Landing Craft	9 x 44 m,	Ketapang	Gilimanuk	the waves rammed into	15 dead, 38 rescued	isisi JayaWijaya
*	Apr 19,1994	Gilimanuk		Tank	214.5 GRT	Port,East Java	Port,Bali	the ship & ship upside down	28 dead,23 missed	

NO	DATE	PLACE			ABOUT SHIP			ACCIDENT CRITERIA	VICTIM	DESCRIPTION
162	Apr 22 1004	Mahakam river	NAME SAMA MANUS	TYPE Motor Bost	SIZE	FROM	TO	Crashed because of form	4 dead 1 missed	DESCRIPTION
*	Apr 21,1994	wanakam men	& YULIA	Notor Boat				Crashed because of loggy	6 dead (SamaManis	
	-		Sama Manis - C						Passenger)	
			& Silvia Pratama							
164	Oct 6.1994	Riau Sea	SHAN FURYU &	MV & Motor	11.5 x 72 m			Crashed because by foggy	2 Jurku's crew missed	
			JURKU	Boat				5 665		
165	Oct 18,1994	Bengali Bay,Dhaka	MV SEVEN STAR					the ship was battered by	160 dead	
166	Oct 31.1994	Musi River						waves & winds Crashed because of by	1 dead.others injured	
107	No. 18 1004	Mana Talan d Malalan	CIDEMAL 0	Matan David 6				foggy	for the state of t	
167	Nov 12,1994 Nov 11,1994	Mare Island, Maluku	PUTRA INDAH	Motor Boat & SailBoat				Crashed because of bad weather	5 missed, I baby dead, 2 missed	
			Ciremai & Putra							
168	Dec 17,1994	Talise Island,Sulawesi	Indah 04 KALVARI &	Motor Boat	35 GT	Manado	Tagul Andang	Crashed & upside down	6 dead,4 major injured,10	crash twice by Salvador
100	D 80 1004	Sea	SALVADOR II	Matan David				- Coult	missed	II
109	Dec 20,1994	Sulawesi	KALVARI	Motor Boat				Sank	10 misseu & 0 deau	
170	Dec 21,1994	Barito river		Motor Wooden			Banjarmasin & Balawang	Crashed	5 missed	sailing on the dark
				SpeedBoat		Banjarmasin	Delawalig			without any famp
171	Ian 1995	Batwaan Surahaya &	PINUS	Motor Boat		Surabaya	Banjarmasin	Sank	11 crew missed (include	dihantam waye along 6
1/1	Jan,1995	Banjarmasin	FINOS	Notor Boat		Surabaya	Danjarmasm	Sank	captain),6 crew rescued	m
172	Mar 13,1995	Bali Sea & Taliabu Maluku	SETIA JAYA & Sari	Motor Boat (fishery)	56 GT	Benoa Port & Aer Tembaga Bitung	Maluku Sea	Missed & Sank	12 missed & 23 missed,13 alive	Probably cause by strom
			CAKALANG	(8,8				
173	Mar 17,1995	Kade Baru,Sunda Kelana Port	Pelita Samudra, Tunas Harapan, Kumala	Motor Boat & Barge				Burned		
		-	Tri,Kumala Emas,Berkat Jasa VI	8-						
			Pelita Samudra, Tunas Haranan, Kumala Mas							
			Kumala Tri							
174	Mar 21, 1995	Kahayan River	DEWI INDAH	Motor Boat		Kuala Kapuas	Palangkaraya	Sank	11 alive 8 missed	
175	Apr 7,1995	Between Pangkalan	YANI EXPRESS	Speedboat	engine 500	Pangkalan Kurinci	Tg. Batu	Burned	2 alive,2 missed, 4 burn	
176	May 6,1995	Around Bouy II, Barito	BINAIYA &	Motor Boat	pk Barito : 264	Trisakti Port,	Surabaya &	Crashed	injured 1 minor injury	
		river	BARITO I		DWT(35.69	Banjarmasin &	Trisakti Port			
177	May 17 1005	Rangala Bau	VATUIETIWA	Matan Boot	x 7.20 x 3.3	Surabaya	Chittogong	finathe informed was could		
1//	May 17,1995	bengala bay	KATULISTIWA	Motor Boat	4000 1011	Myanmar	Bangladesh	but only the engine was		
170	Jun 4 1005	Anound Ious See	CAKDA INDALLI	Matan Boot	1000 DWT	Kalimus Bant	Lembel: Nuce	broken down	10 mars 8 2 December	ahlm hanan diat kanal
178	Juli 4,1995	Arounu Java Sea	CARRA INDAH II	Motor Boat	1000 DW1	Surabaya	Tenggara Barat	Burneu & Sank	missed,1 crew rescued	rusak
179	Jun 16,1995	Amurang Bay,North Sulawesi		Motor Boat	15 x 5 m	Arakan Village, Tumpaan	Kapitu Village, Tombasian	Overloaded & ship Upside Down	6 dead,7 missed	
180	Jun 17,1995	Near the Tehau Pier	DOBON SOLO &	MotorBoat &		Tumpuun		Ship Upside Down	1 missed & 2 in hospital	
			HASINADA	Small MotorBoat			Semau island			
181	Jun 18,1995	Likupang Sea	SOLAGRATIA	Motor Boat		Siau,Sangihe Talaud	Manado	Leak & Sank	300 alive	
182	July 3,1995	Pasar Wajo	SUMBER WANGI	Motor Boat		Pasar Wajo	Tukang Besi	Burned	2 missed,2 dead,2 alive	memuat bahan bakar
183	July 8,1995	Sea,Eastern Sulawesi Indragiri river, Riau		Small Motor		Tg. Baru Village	Island Tembilahan	Sank	3 missed,6 alive	fan tersangkut trash
194	July 27 1005	Siaga island Soa	WARDUN	Boat		Labuhan Raja	Komodo island	the ship was bettered by	2 microd 1 dood 5 alivo	0
104	July 27,1995	Slaga Island Sea	WARDON	Speeuboat		Labunan Bajo	Komodo istand	huge waves & winds	5 misseu, i ueau, 5 anve	
185	Aug 12,1995	Bali	JAYA TIRTHA	Motor Boat		PadangBai Port	Buyuk Port,Nusa Penida Bali	Sank	6 dead,3 missed,26 alive	
190	Aug 12 1005	Anound of Moduno	ADUMDALI	Matan Baat		North Jonunud	Te Dough Dout	Engine husbon 9 hit the	11 missed E alive	
160	Aug 15,1995	Strait	POLIYAMA	WIOLOF DOAL		Quay	ig. Ferak Fort	barge	11 misseu, 5 anve	
187	Aug 28 1995	Batu Licin Prana	TRISUA	Forry type	375 top	Banyanwangi	Cilimanuk	the shin was battered by	1 dead 10 missed	
*	Aug 20,1000	Agung,Bali Strait	PRATAMA	Landing Craft	575 1011	Dailyuwaligi	Chimanuk	huge waves &	5 dead,6 missed	
				Tank				shipwrecked		
188	Sep 13,1995	Sunda Strait	SUPER JET III &	Express ship &		Merak & North	Bakauheni &	Collided with a tanker		
			HATNYA MAWATI	Tanker		direction	Sunda strait on the south			
400	0 . 0 4005			Di Gli			direction			
189	Oct 8,1995 Oct 11,1995	Kahayan River Kapuk River		Canoe				Crashed the ship was battered by	6 passenger missed 2 kids missed,6 rescued	
101	Oat 8 1005	- Malaasaa atuait		Matan Boot	190			huge waves	7 danad 9 minored	
131	5 5,1335				horsepower			the ship & sank		
192	Dec 11,1995	Bone Bay	BELIBIS 02 & BUNGA COKLAT	Motor Boat	35 GT & 35 GT	Sapoiha Kolaka Port	Siwa Port	the ship strucked the pole & was upside down	30 dead,80 missed,112 alive	
100	Dec 95 1005	on the ofference of	I WANA CATVA	Motor Dect	2800 tor			Sank	15 alive 11 missed	
193	Dec 20,1990	Philippines, southest	wana sai ta	MULUI DUAL	2020 1011			Jain	15 anve, 11 missed	
194	Dec 27.1995	China Sea Pemangkat, Pontianak	GAPURA V	Motor Boat	100 ton. 35			the ship went aground	12 fisherman injured	
	D. 05.100	miller F		Let T	PK		D 1 5	a 1		
195	Dec 28,1995	10belo Sea,Daruba Maluku	KANI ANGGARA	Motor Boat		1 obelo Port	Daruba Port	Sank	5 died,22 missed,33 rescued	
196	Jan 9,1996	Jenakap Atoll	MURISMAWAI					the engine was broken &		
197	Jan 19,1996	Weh Island waters	GURITA	Motor Boat	146 ton, 31.1	Malahayati Port,	Balohan	Overloaded & Sank	54 dead,47 alive,126 still	
				(ferry)	m x 7.82 m	Banda Aceh	Port,Sabang		missing	
198	Jan 20,1996	Matakiri Sea,Makassar Stacit	BUNGA	SaiBoat		Batu Licin South	Bali	Sank	1 alive, 12 missed	
199	Jan 25,1996	Masalembo Sea	CAHAYA	SailBoat		Kaumantan Surabaya	Banjarmasin	Burned & Sank	1 alive,15 missed	
1			PELADANG			-				
200	Apr 17,1996	Mahakam river	PUTRA	Motor Boat		Pedalaman Tabang	Samarinda	Crashed	7 missed	
1			HARAPAN & JABAL RAHMAT							
201	Jul 16,1996	Bangka Strait Sea		Motor Wooden				the waves rammed into	3 official & 1 fisherman	
202	Jul 18,1996	Kemal Muaraempal	MULTI MAS	Landing Craft		Tarakan	Tg. Redep	Sank	misseu	
203	Jul 20,1996	waters Tomini Bay	AGAPE II	Tank Motor Boat	162 GT	Gorontalo Port	Ampang, South	Sank	39 rescued, 55 dead. 283	
*			AGAPE - 2				east Sulawesi		missed	
204	Jul 25,1996	Java Sea	GARUDA	Motor Boat		Pontianak	Tg. Emas Port,	the waves rammed into	1 crew rescued, 11 missed	
205	Jul 30, 1996	the 3 rd Pion Comme	MT LIDO	Tanker	1441 DWT		Semarang	the ship & sank Exploded & burned	6 crew missed 1 hurned	
		river Palembang						1	injury	
206	Jul 30,1996	Between Waigeo & Sorong Port	NUR INDAH	Motor Boat		North Waigeo Subdistrict	Sorong Port	Sank	5 missed, 2 rescued	

NO	DATE	BLACE			ABOUT SHIP			ACCIDENT ODITEDIA	VICTIM	DESCRIPTION
NU 207	DATE Aug 4 1000	PLACE	NAME	TYPE Bassen sen shin	SIZE	FROM	TO	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
*	Aug 4,1550	wakassai Strait	KABILA	r assenger sinp	99.80 m x 18 m	Bau Bau Port	Makassar	Crashed	novictini	
208	Aug 15,1996	Talaga Island Sea,	SINAR ALAM	Motor Boat	50 ton	Bau Bau Port	West Kabaena	the ship was battered by	3 dead,1 missed,1 seriously	
		Buton						huge waves & sank	injured,25 alive from 30 passengers	
209	Aug 17,1996	Martapura river,		Pioner Ship				strucked the pole & sank	5 missed probably dead	
210	Aug 20,1996	Southest China Sea,	BATAMAS	Tanker	500 DWT		Natuna	Sank		
*	Aug 17,1996	Riau	SENTOSA III							
			SENTOSA							
211	Aug 20,1996	Between Namosan Kunang & Batu	TIBER	Sail Boat	Namosain, Kunang	Batu Tua, Rote Island		Sank	3 dead,14 missed	
		Tua,Rote			F8				- 1 1	
212 213	Oct 3,1996 Nov 15,1996	on the sea on the downstream of	MARLINA JAYA-	Sail Boat Motor Boat		Bugis Village,	Mesuji	Crashed Sank	3 dead no victim	
		Bakung village	2			Menggala	-			
214	Nov 29,1996	Between Penang &	VICTORY	Motor Boat	171 GT	Penang Island,	Belawan Port	Sank	12 crew missed	
215	Dec 3 1996	Belawan	NIRWANA	Motor Boat		Malaysia	Sendanau Village	the waves rammed into	2 rescued (dumped off at) 4	
							8-	the ship & sank	missed	
216	Dec 8,1996	Tg. Priok Port	MV TIDAL	General Cargo ship		Xinggang		Burned		
217	Dec 15,1996	Bakauheni Bort Lompung	JATRA I BSP &	Ferry		Merak	Lampung	the two ships collided		
218	Dec 17,1996	Berombang river,North	GARUDA	Motor Boat		market of		sank	2 dead,49 rescued	
219	Dec 19.1996	Sumatera on the Cilacan	INDAH JAYA VI	Motor Boat		Berombang river Muara Baru Port	Indian Ocean	Sank	7 missed 2 rescued 3 dead	
		offshore,Indian Ocean		niotor Bout			indian occur	5	- induced, 2 rescaled, 5 deda	
220	Dec 26,1996	on the waters of Ambon Bay		Motor Boat				Sank	3 missed	
221	Dec 27,1996	Between Surabaya &	BANUA	Motor Boat & Sail Boat		Surabaya & Banjarmooin	Sampit & Pangkalan hum	Sank	1 dead	
		Banjarmasin &	INDAH &	Sali Boat		banjarmasin	Center			
999	Ian 5 1997	Pangkalan Bun Barito river	HARAPAN II KELIMUTU	Motor Boat	4200 DWT	Banjarmasin	Kalimantan Surabaya	shipwrackad	the shin ran aground	
223	Jan 28,1997	Bawean island,Gresik	MERATUS MAS	Motor Boat	100 m x 17	Tg. Perak Port	Trisakti Port,	Sank	all crew alive	
					m & 4175 ton		Banjarmasin			
224	Feb 17,1997	On the 3 rd Pier of	KOTABUMI	ferry	ton	Bakauheni	Merak	the waves & hurricane		
225	Feb 20 1997	Merak Port On the west side of	PRIORITAS	Motor Boat	3000 ton	Sunda Kelana Port	Tg. Pandan Port	rammed into the ship the waves rammed into	14 crews & 4 passengers	
220	1 CD 20,1557	Kebatu Island, Sunda	TRIORITAD	Motor Boat	5000 1011	Sunda Relapa i ore	Belitung Island	the ship & sank	survived out	
226	Feb 25.1997	Strait Tg. Puiut Suralava.	REGENT	Barge		Tg. Priok	Cilegon	the winds rammed into		
007	14.44007	Merak	DIFFANC		040 GDT			the ship & sank		
227	Mar 4,1997 Mar 5,1997	Masalembo waters	BINTANG PERKASA	Motor Boat	643 GRT	Berau, Samarinda	Tg. Perak, Surabaya	the waves rammed into the ship & sank	2 dead, 12 missed, 61 alive 1 passenger dead, 4 crews	
229	Mar 22 1007	Around of the Pacuruan	SELAVAD	Sail Poat		Paguruan	Endo Flores	Rurned & Sank	missed 5 missed 1 dead 2 hurned	
220	wiai 22,1997	Port Sea	INDAH II	Sali Doat		r asuruari	Ende, Piores	Burneu & Sank	injury & bone fractured	
229	May 15,1997	Between Pasitanete and Bonelohe	HARAPAN JAYA	Fishery machine Boat	5 GT			Sank	14 dead,3 missed	
230	Jun 7,1997	Tg. Tabilah Sea, Riau	ANDOTA	Speedboat				Sank	19 dead, 1 missed	
231	Jun 14,1997	Merak Port	EXPRESS CITRA BAHARI	Ferry		Bakauheni Port	Merak Port	strucked the 3 rd Pier		
232	Jun 21,1997	Ambon Bay	DEWI ARTHA			Kairatu	Kairatu, Seram	Sank	1 crew missed,6 alive	
233	July 12,1997	Batam	MV SENTOSA 10	Ferry		TelagaPungur Port	Island SriBintanpura	Sank	1 dead,11 missed,91 alive	
*	Jul 12 1007	Laka Taka	DELDATADI I	Matan Boot	15 6	(Batam)	(Tg. Pinang)	Sault	14 dead	
234	Jul 13,1997	Lake Toba	FELDATARI I	MOLOF BOAL	15 x 6 11	nga kaja Parapat quay	Island	Salik	from 200 passengers	
235 *	July 20,1997	on the waters of Pangkaiene river	SUMBER JAYA	Motor Boat	9 x 1.75 x 0 70 m	Laiya Island	Pangkep	Sank	13 dead,11 injured, others	
		Makassar			0.70 m				9 dead	
236	July 23,1997 July 19,1997	Bakauheni Port,Lampung	MUFIDAH & TIDAR MAJU	Ferry & Express Ship	5000 ton	Merak	Bakauheni	Crashed & Sank		
997	July 27 1007	Malaka Stuait		MatanDoat 9				Created	40 minored 72 alive	
237	July 27,1997	Malaka Strait		Tanker				Crashed	40 missed, 73 anve	
238	July 25,1997	Tg. Ungka Sea, Riau	HASRAT MULYA	General Cargo shin		Pekan Baru	Tg. Pinang	Burned	2 dead,3 missed	
239	Aug 9,1997	Sunda Strait	RIMBA VI	Motor Boat	12000 ton	West Sumatera	Riau	Sank	the 129 crews went aground	
L*	Aug 8,1997		KIMBA ENAM						on Legundi Island, Lampung	
240	Aug 15,1997	the Southest Beach Manila Bow	THE KINC	Canoe		Cebu Port	Taclibon Lasta	Sank	7 dead, 1 missed	
241	Aug 13,1997	mailla Day	ROGER KALIBO	i city			Island, Manila	rammed into the ship &	10 deau, 100 misseu, 9 alive	
242	Aug 16,1997	Kapuas Murung	STAR	PionerShip				sank strucked the nole & sank	13 dead.2 missed 20 alive	1
243	Aug 19,1997	Brantas river,Surabaya		Dugout	6 x 2.5 m	on the south side	on the north side	Sank	14 dead,11 alive,4 missed,2	
244	Aug 16,1997	Around of Panjang Port	COLUMBIA			(Karah) Panjang	(Gunung Sari) Tg. Padan	Burned & Sank	treated at hospital	the ship was contents of
						Port,Bandar	Port,Riau			the fertilizer
245	Oct 1,1997	Musi River	DJISAMSOE &	Pioner Ship &		Lampully	Mariana &	the CargoShip strucked	9 dead,39 alive from 38	
			SOOPANOVA INTER 2 BII 17FP	General Cargo Ship	5000 NT		Jakarta	the Pionership & upside down	passengers	
0.10	0.4 10 1005	V D'		D'an an C' 1 a		De Jahara	Marshall C	Contrat		
246	Oct 19,1997	Kapuas River	ERIKA T-I	r 10nerShip & Tugboat		Dadahup Kapuas,West	Maraban, South Kalimantan	Crashed	27 dead, 3 missed, 32 allive	
947	Oat 99 1007	Muoi Dinon	CLAMET VIL 0	Tombon 9 Moton	800 DWT 8	Kalimantan	Delemborg	Created & Sould		
*	Oct 22,1997 Oct 21,1997	MUSI MIVEL	SWAKARSA I	Boat	6000 DW1 &		a are invalig	Crasheu & Salik		
248	Oct 23 1997	Musi River	SLAMET VIII	Speedboat &		Sungsang	Palemhang	Crashed & Sank	1 missed, 6 injured	
~10	500 20,1001		& EXPRESS	Express Ship			- accurbing	- using a balla		
249	Oct 24,1997	Musi River	BAHARI 3 FATMAWATI &	Tanker &		<u> </u>		Crashed & Sank		
	,		SAMBUNG RASA	General Cargo						
250	Oct 25,1997	on the offshore of		Ship Fishery Boat &	48 ton &		Ho Chi	Crashed & Sank		
951	Nov 2 1007	Singapura Bukit Kunci San Barra	KERINCI	Container Ship	8384 ton	Sibolgo Dort	Minh,Vietnam Jakarta	etmucked the served of		
201	1100 2,1997	Bay Padang	RERINCI	INIOLOF DOAL		North Sumatera	Jakarta	shipwrecked		
252	Nov 2,1997	Sea of Bangka Island	MV DOO YANG & BOSTA	TugBoat	4000 ton	Singapura	Palembang & Jambi	Sank	3 missed 5 alive	
L		AB	KAYUNG 5	- upoour		n lutr -	5 amos			
253	Nov 14,1997	Sea of Perak Island, Malaysia		Barge		Bukit Minyak Juru Pulang	1g. Pura Langkat. North	Sank	22 missed, 18 alive	
97.4	New 14 1007	MoneKumh, W	MN/ AT AN	Matan D +		Penang Manaulus	Sumatera	aank	10 counsinged 0 3 3	
204	14,1997	Merauke	SAMUDERA	wotor Boat		мегацке		Sailk	10 Survived, 3 dead	
255	Nov 20,1997	Mahakam river,East Kalimantan	LEUSER &	Motor Boat &	6022 ton &	Samarinda Port	Toli Toli	Crashed	4 minor injury,712 alive	
1		mantan	LATIO LATIO V	Boat	5555 1011					

NO	DATE	DI ACE			ABOUT SHIP			ACCIDENT ODITEDIA	UCTD	DESCRIPTION
NO	DATE	PLACE	NAME	TYPE	SIZE	FROM	то	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
256	Nov 21,1997	Tg. Tembaga Port, Probalingga		Motor Boat &				Burned	43 ships burned in Tg. Tombaga Port	
257	Nov 24,1997	Micronesia Waters		Canoe		Manado		the canoe washed away for	4 alive from 13 passenger	
050	1 00 1000			M. D. J			111	3000 km		
258	Jan 22,1998	Labuangkallo (Pasir) waters of Makassar	RAHMAT SEJATI	Motor Boat		Tanah Grogot	Kandillo river	Sank	1 missed, 12 dead,42 alive	
		Strait					Village			
259	Feb 3,1998	Benoa Port, Denpasar Thousand Island	PUTRA JAYA	Motor Boat Trolling Ship		Muara	Mocuii	Burned	4 microd 5 aliva	
200	1 CD 7,1000	waters	DAIGNA MAJO	Troning Ship		Angke,North	Waters,South	Shipwreekeu	4 misseu,o anve	
961	Ion 24 1008	Tr. Datuk Watara off	CAMPLICANT	Matan Boot		Jakarta CangCang Luan	Sumatera	Could	57 missed 95 dead 99 alive	
201	Jan 24,1996	Riau	SANDU SAKTI	MOLOF BOAL		Inhil	Bengkalis	Salik	57 misseu, 25 ueau, 52 anve	
262	Feb 12,1998	on the sea	PUTRI	Motor Boat	16 DWT	Ambon Island	Ambalau Island	the ship adrift & buffeted	51 alive,the captain missed	the captain was looked
263	Jun 25,1998	Alas Strait Nusa	NURSABAH BAHANA	Ferry	27.74 m x	Pototano.	Kayangan	in the sea Sank	21 dead 21 missed 52 alive	for help
*	,	Tenggara Barat	NUSANTARA)	7.8 m, 375	Sumbawa	Port,Lombok		35 dead,1 crew dead	
264	Jun 20 1008	Rimau Balak Island	MENGGALA	Motor Boat	ton	Merak	Bakaubeni	Shipwrecked		
201	5ull 25,1550	Bakauheni	MENGGALA	Niotor Doat		WETAK	Dakadiiciii	Sinpwreekeu		
265	July 12,1998	Way Mesuji river Malaka Strait	SINADUNC 9	SpeedBoat		Balaman 9	Ter Duisle 9	Sank	2 missed, 25 alive	
200	Aug 17,1996	Malaka Strait	WORLD NORD	Panama Tanker		Singapura	Spanyol	Crasheu	4 dead, 4 injured	
0.07	1 17 1000		VIDIONIA 4	M. D.		•		a 1		
267	Aug 17,1998	Around of Seribu Island & Cituis fisherv Port	KRISNA I	Motor Boat		Lancang Island.Seribu	Fishery Port	Sank	7 dead,9 missed,20 injured	
						Islands				
268	Aug 22,1998	Malaka Strait	DEWI MAS	Motor Boat	494 GT	Penang Island, Malaysia	Belawan Port	Missed	15 crews missed	
269	Aug 25,1998	around of the Pier of	DOBONSOLO	Motor Boat		Dili	Ambon	Shipwrecked		
270	Sept 17 1998	Dili Port on the north Beach		Tanker &	9 ton			Crashed	1 dead	
			SEJATI	Fishery Motor						
271	Oct 22,1998	Sambas river	SUMBER NIAGA	Boat Motor Boat		Sunda Kelana Port	Sintete Port	Sank		
~.1			I	Dout		recupa i oit				
272	Nov 6,1998	Bakauheni Port,on the offshore	TITIAN MURNI	PassengerShip		Merak	Bakauheni	Shipwrecked		
273	Nov 9,1998	Galesong waters off	ANDRIANI	Motor Boat		Salamona Island,	Mangindara	Upside down ship	4 dead,6 missed,30 alive	
1		South Sulawesi	INDAH			10 km from Makassar	village, Galesong			
274	Nov 12,1998	Lambasina Island	RAHMAT	Ferry	2000 GRT,	manassai		the waves rammed into	15 dead, 10 missed, 154 alive	
*	Nov 13,1998	waters of Kolaka,Bone Bay	BUHARI		tonnage 413			the ship & the engine	21 dead,13 cars sank	
275	Nov 25,1998	Sunda Strait	NUSA MULYA	Ferry	-	Merak	Bakauheni	Shipwrecked		
*	N 00 1007	Cil	Nusa Mulia	Matan P				ah	4.6.1	-
276	Nov 29,1998	Cilacap Sea	PATRAK JAYA	Motor Boat				the waves rolled up the ship	4 fisherman dead	
277	Dec 25,1998	Adang Bay,East	SURYA	Motor Boat		Tanah	Loading	the ship was struck by	3 dead,2 burned injury	
		Kalimantan				Grogot,Pasir Island	Batubara, Pasir Regency	lightning		
278	Dec 25,1998	Brantas river,Surabaya		Dugout		Podoroto Village	Keboan Village	Upside down ship	2 dead,6 missed,24 alive	
279	Dec 28 1998	Sunda Strait Sea	ADINDA	Ferry		Bakauheni	Merak	the ship went aground	5 dead 3 missed 24 alive	
2.0	Dec 20,1000	Bundu Birun Beu	LESTARI 101	i enj		Dunuunem	Merun	the ship went uground	o deduțo missed,27 dirve	
280	Dec 30,1998	Port of Sila Village	REJEKI & HENA RIRI JAYA	Motor Boat		Ambon & Saparua	Nela Heya Village	Crash & sank	5 dead,	Rejeki's ship sank
281	Feb 7,1999	Around of Kalumpang	BINA BERSAMA	River Taxi		Kuala Kapuaas	Hinterland Area	Exploded	7 dead, 4 missed	the electricity off & the
		Village								engine bespattered with
282	Feb 6,1999	Southest China Sea	HARTA RIMBA	SailBoat	147 ton, 30 x	Kuala Sambas	Pekan Baru,Riau	Sank	19 passenger & Captain	gasonne
*			Artha Rimba		10 m				alive, 19 dead from 325	
									313 dead/missed	
283	Feb 7,1999		HANAKA	Motor Boat		Pemangkat Port	Pekan Baru, Riau	Sank	280 missed from 300	
284	Feb 23,1999	Bakauheni Port	NUSA DHARMA	Ferry		on the quay 1 st of		the two ships scraped	passenger	
			& SENOPATI			Bakauheni Port	on the quay 4 th of	each other		
285	Feb 27.1999	Benoa Port.Denpasar	Surva Terbit	Fishery Boat			Bakauheni Port	Burned	1 burned injury	the ships was released
			07,Surya Terang						.	the anchor at Benoa Port
			12,Bahari Kencana							
286	May 4,1999	Lembeh Sea	CINTA DAMAI	Motor Boat	10 GT	Batang Dua	Bitung	Upside down ship	1 dead, 12 missed, 16 alive	
287	May 8,1999	Sunda Kelapa Port	SEJAHTERA VIII			Maluku		Burned	trom 29 passenger 1 burned iniurv	the engine's shin had
								a 1	J. J.	broken down
288	May 8,1999	wowoni Island,South East Sulawesi	PANGEBU	Motor Boat		Biringkasi Port Pangken	Ternate,North Maluku	Sank	10 dead,1 alive.17 missed	
L						South Sulawesi	u	ant		
289	Jun 16,1999	Cempedak cape.Wawoni Strait	ILOLO GADING	Motor Boat		Raha	Kendari, South East Sulaweri	Shipwrecked		
290	Aug 11,1999	Paotere Port, Makassar	Duta Karya,	Motor Boat			Lust Sulawesi	Burned		
1			Minasa Harapan, Sahar Jaya Jolor							
1			Surga Abadi,							
201	Son 20 1000	Tø Perak Port	Buah Saudara	Motor Boat				Exploded	1 dead 1 missed	the ship was repaired on
*	Aug 14.1999	- 5. 1 CIUN I UIL	Sindulang					Sank	no victim	the port
1										
202	Dec 2 1000	Around of Pakring	DUMAT	Ferry	150 ton	Bengkalie	Batam	Exploded & burned	5 dead 6 burned inium from	
*	200 2,1000	river, Bengkalis	EKSPRESS VI	,					200 passengers	
293	Jan 12 2000	on Warokumba	SARTIKA	Motor Bost		Ampera village	Warokumba	Sank	6 dead 6 dead 1 missed 2 alive	
233	5an 16,6000	Sea,South East	SAWI INA	JUCUI DUdl		Kendari		Coulin .	s scau, i misseu, a anve	
204	Ian 14 2000	Sulawesi Cilincing Sea	ΙΔΥΔ ΡΔΚΤΙ	Motor Boot				Crashed	1 fisherman dead & 2 alive	hit and run
295	Jan 17,2000	Tg. Perak Port	TIDAR	Motor Boat		1		3 passengers fell down	A noncriman ucau & 4 anve	ine and i dil
								from the shipstair, the height is 7 m		
296	Jan 23,2000	Maluku Sea	LINTAS	Motor Boat	15 GT	Molore	Kendari, South	Sank	42 alive from 53 passengers	
1			SAMODERA			Port,Center	East Sulawesi			
297	Feb 12,2000	Bawean sea,Gresik	PERKASA S 2	Motor Boat	L	Gresik Port	Kumai,West	the waves rammed into	13 crews missed	
900	May 7 9000	on the weters of AI	MASNATT	Motor Bast	200 tom	Limine A.	Kalimantan Waininit Summ	the ship & sank	41 dood hundred at a 1	the chin was less in it.
298	wiay 7,2000	island between Tg.	MASINALI	wotor Boat	200 ton	Island	waipirit, Seram Island	huge waves & sank	+1 ueau,nunarea missea	40 tons of cements,20
1		Hutumuri & Tg. Tial						-		tons of fertilizer,2 buses
299	May 5,2000	on the Da Bac river,		Ferry				the ship was overload &	7 missed	& 2 trucks
		Hai Phong port city		-				up side down		
300	May 16,2000	on the waters of	KRI RATEO 702	Navy ship &				Crashed & KRI Rateo	all crew alive	
1		Bui,200 miles from	& IRIS MASAU	general cargo				Sank		
301	June 2,2000	Gresik port In the waters of Tello		snip PassengerShip		Sibarano island			4 dead,24 in hospital	
	,	island, Nias		9P			1			

NO	DATE	PLACE	NAME	TVDE	ABOUT SHIP	FROM	TO	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
302	June 7,2000	In the waters of Bali	CITRA	PassengerShip	432 GRT,	Ketapang	Gilimanuk	the ship was battered by	51 rescued,6 dead,25 missed	the ship was loaded with
		strait	MANDALA		40.4 m X 9.5			huge waves & sank		9 cars,4 truck
			BHAKTI		m & 1000 PK					
303	June 29,2000	Around of waters of	CAHAYA	Motor Boat		Tobelo,North	Manado,North	sank	1 dead, 10 dead from 500	the ship was transport
304	July 7.2000	Sahu-Sangir Talaud Nina-nina Cape	BAHARI SINAR	Sailing boat	103 GT	Maluku Seram island	Sulawesi Makassar.South	the ship was run aground	passenger	500 refugees from Galela the ship was transport
	- mj 1,2000		BONTANG	8			Sulawesi			120 cows etc
305	Jul 1,2000	Around of Pomako port, Timika	NURUL FALA	Motor Boat		Makassar	Timika	sank	4 dead, 20 missed,6 alive	
306	July 19,2000	on the waters of west Australia,75 miles from	SULTENG I / YEFI	General Cargo ship	96 m, 3,440 DWT	Christmas island	Indonesia	Sank	all crew (23 people) rescued	the ship was contents of the phosphate
307	July 25,2000	on the waters of Penyu	MT HCC		10 X 50 m,	Cilacap	Pare-pare, South	leak & sank	all crew rescued	the ship was contents of
		bay sea ,Cilacap			1154 DWT,740 GT		Sulawesi			1,000 metric ton liquid asphalt
308	July 31,2000	on the mouth of	KURNIA	Motor Boat		Kendari	Ereke	the ship was battered by	5 dead from 32 passengers	
309	Aug 8.2000	Kendari Bay Kahayan riyer Kapuas		Pionership				huge waves & sank Unside down shin	3 police dead 1 missed	
310	Sep 1,2000	on the water of Manipa	MULYA STAR	Sailing boat		Pelita Jaya Port,	Probolinggo	the huge waves & strong	3 dead,25 alive,16 missed	the ship contents are 20
		strait,Maluku				Piru West Seram		winds rammed into the shin & sank		ton cloves,100 ton copra
311	Sept 6,2000	Albert lake,north west		Canoe		Hoima district	Nebbi,north west	upside down ship & sank	13 alive,15 dead,37 missed	
319	Sept 8 2000	of Uganda Peelakhar rive Uttar		Canoe			of Uganda	unside down shin & sank	probably dead 5 alive 35 probably dead	
		Pradesh,India								
313	Sept 19,2000	on the southest China sea	MV MAJUKARSA	General Cargo ship		Sunda Kelapa port,Jakarta	Pangkalbalam port,Pangkal Pinang	leak & sank	1 crew missed	
314	Oct 3,2000	Around of waters of	NATUNA SEA	Tanker		Jeddah,Saudi	China	Leak		the tanker contents
315	Oct 11,2000	Between Mor island &	UMSINI	Motor Boat	120 m	Arabia Serui, Yapen	Nabire	the ship strucked the coral		526,000 barel crude oli
		Jauman,3 km from Nabire city,Irian Jaya				Waropen District		& ran aground		
316	Oct 22,2000	Manado bay	BAHTERA	Motor Boat		Kalijengki port	Bunaken island	the huge waves & strong winds rammed into the	1 dead,1 missed,48 alive	
017	N 10 0000	A	CDLLECMONO	Fish and Chin				ship	1 and an all a all an	
317	Nov 19,2000	Around of 200 m from Depok beach,	SRI LESMONO	Fishery Ship				the ship was battered by huge waves & sank	1 missed,2 alive	
		Parangtritis, Yogyakart						0		
318	Dec 7,2000	a Around of waters of	HASIL KARYA 2	Sailing boat	6 GT	Ternate	Tobotobo village	the ship was battered by	19 dead, from 135	
		P.Kahatola, north side		0			& Dama	huge waves & missed	passengers	
319	Dec 14,2000	of Halmahera Mahakam river,East	SURYA	River Taxi		Longbagun	Samarinda	sank	18 dead from 62 passengers	
		Kalimantan	KALIMANTAN 2			subdistrict, west				
320	Dec 31,2000	Mahakam river,East		Motor Boat		Handil	Sidondang	sank	8 dead,5 alive	
321	Jan 11.2001	Kalimantan On the waters of		PassengerShip	9 X 2 m	Takaneke Island	village Lamangkia	the waves was rammed	4 dead 4 missed 2 alive	
	,	Takalar district,South		8P			8	into the ship & sank	,,	
322	Ian 25 2001	Sulawesi Mahakam river Fast	MANUMBAR 12	Long craft tank		Tenggarong Kutai	Long Bagun	Crashed & Senavan I	2 missed 25 alive	
	5411 20,2001	Kalimantan	& SENAYAN I	(LCT) & River Taxi		renggarong,riutar	Long Dagan	sank	z misicu, zo unve	
323	Feb 4,2001	On the offshore of Jailolo beach	ULEO PUTERA	Motor Boat		Ahmad Yani Port, Ternate	Galela	the ship was battered by huge waves & hurricane &	21 dead	
20.4	Esh 5 2001	on the Muor - Down		Matan D 4				shipwwrecked		
324	Feb 5,2001	on the Muara Baru port	NAILI XII, NAILI XVI, A- LONG MAKMUR	Motor Boat				Burnea		
325	Feb 10,2001	on the waters of Tanakeke, South	SANTINI III	Motor Boat	9000 DWT	Maluku	Gresik	Leak & sank		
L		Sulawesi								
326	Feb 11,2001	on the Lampu island	NUSA RAYA	Sailing boat		Tg. Perak port	Sumbawa	the ship was battered by huge waves &		
327	Feb 15,2001	Around of Cirebon Sea		Fishery Boat				shipwrecked the waves rammed into	2 crews missed & 3 ships	
328	Mar 15,2001	between Jayapura &	BANGUN JAYA	Motor Boat		Jayapura	Takar	the ship & sank Burned & Sank	sank 2 dead,10 alive	
329	Mar 15.2001	Takar on the waters of	LINTAS ALAM	Sailing boat	5000 DWT	Javapura	Yamma island	Burned & Sank	2 dead 7 missed 41 alive	
		Depapre,Irian Jaya					T. DI		a 1 1	
330	Mar 31,2001	Siak waters	JUWITA & BINTANG OCEAN	Motor Boat & Tug Boat		Pekan Baru	Tg. Pinang	the two ships was collide	3 dead	
331	Apr 15,2001	on the center Tabukan		Motor Boat		North Tabukan	Kulur village II	sank	21 dead,7 alive,1 missed	
332	Apr 23,2001	between Werinama & Banda		Motor Boat		Werinama,Seram	Banda,center Maluku	Sank		
333	Apr 24,2001	on the Rawa Kalong	REMPAS	Motor Boat	40 PK	Ratu	Ciwaru,Ciemas	Sank	4,dead,36 alive	
1		waters, Ratu Port, Sukabumi				port,Sukabumi west Java	subdistrict			
334	Apr 29,2001	on the Harimau island Sunda Strait	JATRA I	Motor Boat		Merak	Bakauheni	Shipwrecked		
335	May 4,2001	in the Goma city	MV MUSAKA	Ferry		Bukavu	Goma	upside down & sank	12 dead, 100 missed	
336	May 19,2001	on the waters of Tanjung Toba bay	BUANA BARU	Motor Boat		Siva pier	Tobaku port	Burned & Sank	5 missed, 11 alive	
Appendix 2.7.3. Verification of DGSC's Marine Casualty Data by Scrap in 1994

NO	DATE	PLACE		•	ABOUT SHIP	-		ACCIDENT CRITERIA	VICTIM	DESCRIPTION
110	DAIL	TEACE	NAME	TYPE	SIZE	FROM	то	ACCIDENT CRITERIA	VICIIM	DESCRIPTION
1	Jan 3,1994	Around of Manado sea		Motor Boat		Manado	Bunaken	Ship Upside Down	1 dead,2 missed,18 alive	
2	Jan 15,1994	Balikpapan Sea	MUTIARA JAYA III	Motor Boat		Kampung Baru Port Balikpapan	, Salisingan Island, Makassar strait	Burned & Sank	all crew rescued	
3	Jan 18,1994	Bengawan Solo river		Pioner Ship		Plupuh village	Kembangan Village	Ship Upside Down	14 passenger are missed	
4	Jan 26,1994	Southest China Sea	COSMOS		15,742 ton			Burned	9 crew from Indonesia missed	
5	Feb 3,1994	Tg. Perak Port	YITROS	Motor Boat				Burned & Sank	17 cars	
6	Feb 7,1994	Mahakam river	KOMPAS WAHYU III	Motor Boat		Pasar pagi Pier, Samarinda	Mangkujenang, Paalasan	Crashed & Sank	4 missed,16 alive	
7	Feb 10,1994	Bekasi river		Pioner Ship	1.5 x 5 m			Ship Upside Down	4 dead,11 missed	
8	Mar 8,1994	On the Flores sea of waters	ALKIAT	Motor Boat				the ship was battered by hurricane & almost sank		the ship was rescued by KRI Jayawijaya
9	Mar 24,1994	Selopeng Beach		Canoe				Ship Upside Down	3 kids dead	
10	Mar 28,1994	Around of Sulawesi Sea	SANTALIA SUPER	2		Pare-Pare	Nunukan, East Kalimantan	The engine was broken floating for 3 days		
11	Apr 21,1994	Between Ketapang & Gilimanuk	KALTIM MAS II	Landing Craft Tank	9 x 44 m, 214.5 GRT	Ketapang Port,East Java	Gilimanuk Port,Bali	the waves rammed into th ship & ship upside down	e 15 dead, 38 rescued	
12	Apr 23,1994	Mahakam river	SAMA MANIS & YULIA	Motor Boat				Crashed because of fogg	4 dead, 1 missed	
13	Oct 6,1994	Riau Sea	SHAN FURYU & JURKU	MV & Motor Boat	11.5 x 72 m			Crashed because by foggy	2 Jurku's crew missed	
14	Oct 31,1994	Musi River						Crashed because of by foggy	1 dead,others injured	
15	Nov 12,1994	Mare Island,Maluku	CIREMAI & PUTRA INDAH	Motor Boat & SailBoat				Crashed because of bad weather	5 missed,1 baby dead,2 missed	
16	Dec 17,1994	Talise Island,Sulawesi Sea	KALVARI & SALVADOR II	Motor Boat	35 GT	Manado	Tagul Andang	Crashed & upside down	6 dead,4 major injured,10 missed	crash twice by Salvador II
17	Dec 20,1994	Banda & North Sulawesi	MERIDIEN & KALVARI	Motor Boat				Sank	16 missed & 6 dead	
18	Dec 21,1994	Barito river		Motor Wooden Ship & SpeedBoat		Banjarmasin	Banjarmasin & Belawang	Crashed	5 missed	sailing on the dark without any lamp
So	Irce:	The Jakarta Post REPUBLIKA Bisnis Indonesia Merdeka Antara	KC Me Su An	OMPAS edia Indonesia ara Pembarua gkantan Berse	nn enjata	SUARA KAR Rakyat Merc Business Ne Pelita	2YA leka ws		Remarks: Patterned Data not showed in the DGSC's Data in Appendix 2.7.1.	means that it is Marine Casualty

1994 Unlisted in the DGSC Marine Casualty Data List Missing Total 70 100 No. of Case Dead 15 30

Appendix 2.7.4. Verification of DGSC's Marine Casualty Data by Scrap in 1995

NO	DATE	PLACE	NAME	TYPE	ABOUT SHIP	FROM	то	ACCIDE	NT CRITERIA	VICTIM	DESCRIPTION
1	Jan,1995	Between Surabaya & Banjarmasin	PINUS	Motor Boat		Surabaya	Banjarmasin	Sank		11 crew missed (include captain),6 crew rescued	rammed by the wave along 6 m
2	Mar 13,1995	Bali Sea & Taliabu,Maluk u	SETIA JAYA & SARI CAKALANG	Motor Boat (fishery)	56 GT	Benoa Port & Aer Tembaga, Bitung	Maluku Sea	Missed	& Sank	12 missed & 23 missed,13 alive	Probably cause by strom
3	Mar 17,1995	Kade Baru,Sunda Kelapa Port	Pelita Samudra, Tunas Harapan, Kumala Tri,Kumala Emas,Berkat Jasa VI	Motor Boat & Barge				Burned			
4	Mar 21,1995	Kahayan River	DEWI INDAH	Motor Boat		Kuala Kapuas	Palangkaraya	Sank		11 alive,8 missed	
5	Apr 7,1995	Between Pangkalan Kurinci & Tg.	YANI EXPRESS	Speedboat	engine 500 pk	Pangkalan Kurinci	Tg. Batu	Burned		2 alive,2 missed, 4 burn injured	
6	May 6,1995	Around Bouy II,Barito river	BINAIYA & BARITO I	Motor Boat	Barito : 264 DWT(35.69 x 7.20 x 3.5 m)	Trisakti Port, Banjarmasin & Surabaya	Surabaya & Trisakti Port	Crashed		1 minor injury	
7	Jun 16,1995	Amurang Bay,North Sulawesi		Motor Boat	15 x 5 m	Arakan Village, Tumpaan	Kapitu Village, Tombasian	Overloade Down	ed & ship Upside	6 dead,7 missed	
8	Jun 17,1995	Near the Tehau Pier	DOBON SOLO & HASINADA	MotorBoat & Small MotorBoat			Semau island	Ship Ups	ide Down	1 missed & 2 in hospital	
9	Jun 18,1995	Likupang Sea	SOLAGRATIA	Motor Boat		Siau,Sangihe Talaud	Manado	Leak & S	ank	300 alive	
10	July 3,1995	Pasar Wajo Sea,Eastern Sulawesi	SUMBER WANGI	Motor Boat		Pasar Wajo	Tukang Besi Island	Burned		2 missed,2 dead,2 alive	memuat bahan bakar
11	July 8,1995	Indragiri river, Riau		Small Motor Boat		Tg. Baru Village	Tembilahan	Sank		3 missed,6 alive	fan tersangkut trash
12	July 27,1995	Siaga island Sea	WARDUN	Speedboat		Labuhan Bajo	Komodo island	the ship v huge wav	vas battered by es & winds	3 missed,1 dead,5 alive	
13	Aug 12,1995	Bali	JAYA TIRTHA	Motor Boat		PadangBai Port	Buyuk Port,Nusa Penida Bali	Sank		6 dead,3 missed,26 alive	
14	Aug 13,1995	Around of Madura Strait	ARUMBAI I POLIYAMA	Motor Boat		North Jamrud Quay	Tg. Perak Port	Engine b barge	roken & hit the	11 missed, 5 alive	
15	Aug 28,1995	Batu Licin,Prapa Agung,Bali Strait	TRISILA PRATAMA	Ferry type Landing Craft Tank	375 ton	Banyuwangi	Gilimanuk	the ship huge way	was battered by /es & shipwrecked	1 dead,10 missed	
16	Sep 13,1995	Sunda Strait	SUPER JET III & HATNYA MAWATI	Express ship & Tanker		Merak & North direction	Bakauheni & Sunda strait on the south direction	Collided v	vith a tanker		
17	Oct 8,1995	Kahayan River		Pioner Ship				Crashed		6 passenger missed	
18	Oct 8,1995	Makassar strait		Motor Boat	120 horsepower			the waves ship & sa	rammed into the nk	7 dead,2 missed	
19	Oct 11,1995	Kapuk River		Canoe				the ship v huge wav	vas battered by es	2 kids missed,6 rescued	
20	Dec 11,1995	Bone Bay	BELIBIS 02 & BUNGA COKLAT I	Motor Boat	35 GT & 35 GT	Sapoiha Kolaka Port	Siwa Port	the ship : & was up	strucked the pole oside down	30 dead,80 missed,112 alive	
21	Dec 27,1995	Pemangkat, Pontianak	GAPURA V	Motor Boat	100 ton, 35 PK			the ship	went aground	12 fisherman injured	
22	Dec 28,1995	Tobelo Sea,Daruba Maluku	RANI ANGGARA	Motor Boat		Tobelo Port	Daruba Port	Sank		5 died,22 missed,33 rescued	
Sou	Irce:	The Jakar REPUBLI Bisnis Ind Merdeka Antara	ta Post KA onesia	KOMPA Media In Suara Pe Angkant	S Idonesia embaruan an Bersenj	SUA Raky Busi ata Pelit	RA KARYA ⁄at Merdeka ness News a		Rema not sł Data	arks: Patterned Data mear nowed in the DGSC's Mari in Appendix 2.7.1.	ns that it is ne Casualty

	199)5		
Unlisted in the D	GSC Ma	rine Casualt	y Data List	
No. of Case	Dead	Missing	Total	
11	21	95	116	

Appendix 2.7.5. Verification of DGSC's Marine Casualty Data by Scrap in 1996

NO	DATE	PLACE	NAME	TVPF	ABOUT SHIP	FROM	то	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
1	Jan 9,1996	Jenakap Atoll island,Seribu island	MURISMAWAI	IIIL	JIEL	TROM	10	the engine was broken & shipwrecked		
2	Jan 19,1996	Weh Island waters	GURITA	Motor Boat (ferry)	146 ton, 31.1 m x 7.82 m	Malahayati Port, Banda Aceh	Balohan Port,Sabang	Overloaded & Sank	54 dead,47 alive,126 still missing	
3	Jan 20,1996	Matakiri Sea,Makassar Strait	BUNGA PURNAMA	SaiBoat		Batu Licin South Kalimantan	Bali	Sank	1 alive, 12 missed	
4	Jan 25,1996	Masalembo Sea	CAHAYA PELADANG SEJAHTERA	SailBoat		Surabaya	Banjarmasin	Burned & Sank	1 alive,15 missed	
5	Apr 17,1996	Mahakam river	PUTRA HARAPAN & JABAL RAHMAT	Motor Boat		Pedalaman Tabang	Samarinda	Crashed	7 missed	
6	Jul 16,1996	Bangka Strait Sea		Motor Wooden ship				the waves rammed into the ship	3 official & 1 fisherman missed	
7	Jul 18,1996	Kemal Muaraempal waters	MULTI MAS	Landing Craft Tank		Tarakan	Tg. Redep	Sank		
8	Jul 20,1996	Tomini Bay	AGAPE II	Motor Boat	162 GT	Gorontalo Port	Ampang, South east Sulawesi	Sank	39 rescued, 55 dead, 283 missed	
9	Jul 25,1996	Java Sea	GARUDA	Motor Boat		Pontianak	Tg. Emas Port, Semarang	the waves rammed into the ship & sank	1 crew rescued, 11 missed	
10	Jul 30,1996	the 3rd Pier, Gerong river Palembang	MT LIDO	Tanker	1441 DWT			Exploded & burned	6 crew missed,1 burned injury	
11	Jul 30,1996	Between Waigeo & Sorong Port	NUR INDAH	Motor Boat		North Waigeo Subdistrict	Sorong Port	Sank	5 missed, 2 rescued	
12	Aug 4,1996	Makassar Strait	CIREMAI & TILONG KABILA	Passenger ship	99.80 m x 18 m	Bau Bau Port	Makassar	Crashed	no victim	
13	Aug 15,1996	Talaga Island Sea, Buton	SINAR ALAM	Motor Boat	50 ton	Bau Bau Port	West Kabaena	the ship was battered by huge waves & sank	3 dead,1 missed,1 seriously injured,25 alive from 30 passengers	
14	Aug 17,1996	Martapura river, Banjarmasin		Pioner Ship				strucked the pole & sank	5 missed probably dead	
15	Aug 20,1996	Southest China Sea, Riau	BATAMAS SENTOSA III	Tanker	500 DWT		Natuna	Sank		
16	Aug 20,1996	Between Namosan Kupang & Batu Tua,Rote	TIBER	Sail Boat	Namosain, Kupang	Batu Tua, Rote Island		Sank	3 dead,14 missed	
17	Oct 3,1996	on the sea		Sail Boat				Crashed	3 dead	
18	Nov 15,1996	on the downstream of Bakung village	MARLINA JAYA-2	Motor Boat		Bugis Village, Menggala subdistrict	Mesuji	Sank	no victim	
19	Nov 29,1996	Between Penang & Belawan	VICTORY	Motor Boat	171 GT	Penang Island, Malaysia	Belawan Port	Sank	12 crew missed	
20	Dec 3,1996		NIRWANA	Motor Boat			Sendanau Village	the waves rammed into the ship & sank	2 rescued (dumped off at),4 missed	
21	Dec 8,1996	Tg. Priok Port	MV TIDAL	General Cargo ship		Xinggang		Burned		
22	Dec 15,1996	Bakauheni Port,Lampung	JATRA I BSP & NUSA JAYA	Ferry		Merak	Lampung	the two ships collided		
23	Dec 17,1996	Berombang river,North Sumatera	GARUDA	Motor Boat		market of Berombang river		sank	2 dead,49 rescued	
24	Dec 19,1996	on the Cilacap offshore,Indian Ocean	INDAH JAYA VI	Motor Boat		Muara Baru Port	Indian Ocean	Sank	7 missed,2 rescued,3 dead	
25	Dec 26,1996	on the waters of Ambon Bay		Motor Boat				Sank	3 missed	
26	Dec 27,1996	Between Surabaya & Sampit, between Banjarmasin & Pangkalan Bun	BANUA NUSANTARA INDAH & HARAPAN II	Motor Boat & Sail Boat		Surabaya & Banjarmasin	Sampit & Pangkalan bun, Center Kalimantan	Sank	1 dead	

Source:

The Jakarta Post REPUBLIKA

Bisnis Indonesia Merdeka

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KOMPAS Media Indonesia Suara Pembaruan Angkantan Bersenjata

SUARA KARYA Rakyat Merdeka Business News Pelita

Remarks: Patterned Data means that it is not showed in the DGSC's Marine Casualty Data in Appendix 2.7.1.

	19	96		
Unlisted in the D	GSC M	arine Casual	y Data Li	st
No. of Case	Dead	Missing	Total	
22	70	389	459	

Appendix 2.7.6. Verification of DGSC's Marine Casualty Data by Scrap in 1997

NO	DATE	PLACE	NAME	TYDE	ABOUT SHIP	FROM	TO	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
1	Jan 5,1997	Barito river	KELIMUTU	Motor Boat	312E 4200 DWT	гком Banjarmasin	Surabaya	shipwrecked	the ship ran aground	
2	Jan 28,1997	Bawean island,Gresik	MERATUS MAS	Motor Boat	100 m x 17 m & 4175 ton	Tg. Perak Port	Trisakti Port, Banjarmasin	Sank	all crew alive	
3	Feb 17,1997	On the 3rd Pier of Merak Port	KOTABUMI	ferry		Bakauheni	Merak	the waves & hurricane rammed into the ship		
4	Mar 5,1997	Masalembo waters	BINTANG PERKASA	Motor Boat	643 GRT	Berau, Samarinda	Tg. Perak, Surabaya	the waves rammed into the ship & sank	2 dead,12 missed, 61 alive	
5	Mar 22,1997	Around of the Pasuruan Port Sea	SELAYAR INDAH II	Sail Boat		Pasuruan	Ende,Flores	Burned & Sank	5 missed,1 dead,2 burned injury & bone fractured	
6	May 15,1997	Between Pasitanete and Bonelohe	HARAPAN JAYA	Fishery machine Boat	5 GT			Sank	14 dead,3 missed	
7	Jun 7,1997	Tg. Tabilah Sea, Riau	ANDOTA EXPRESS	Speedboat				Sank	19 dead, 1 missed	
8	Jun 21,1997	Ambon Bay	DEWI ARTHA			Kairatu	Kairatu, Seram Island	Sank	1 crew missed,6 alive	
9	July 12,1997	Batam	MV SENTOSA 10	Ferry		TelagaPungur Port (Batam)	SriBintanpura (Tg. Pinang)	Sank	1 dead,11 missed,91 alive	
10	Jul 13,1997	Lake Toba	PELDATARI I	Motor Boat	15 x 6 m	Tiga Raja Parapat quay	Tomok, Samosir Island	Sank	60 dead,50 alive,80 missed from 200 passengers	
11	July 20,1997	on the waters of Pangkajene river, Makassar	SUMBER JAYA	Motor Boat	9 x 1.75 x 0.70 m	Laiya Island	Pangkep	Sank	13 dead,11 injured, others missed	
12	July 23,1997	Bakauheni Port,Lampung	MUFIDAH & TIDAR MAJU	Ferry & Express Ship	5000 ton	Merak	Bakauheni	Crashed & Sank		
13	July 25,1997	Tg. Ungka Sea, Riau	HASRAT MULYA	General Cargo ship		Pekan Baru	Tg. Pinang	Burned	2 dead,3 missed	
14	July 27,1997	Malaka Strait		MotorBoat & Tanker				Crashed	40 missed,73 alive	
15	Aug 9,1997	Sunda Strait	RIMBA VI	Motor Boat	12000 ton	West Sumatera	Riau	Sank	the 129 crews went aground on Legundi Island, Lampung	
16	Aug 15,1997	the Southest Beach		Canoe				Sank	7 dead, 1 missed	
17	Aug 16,1997	Kapuas Murung		PionerShip				strucked the pole & sank	13 dead,2 missed.20 alive	
18	Aug 16,1997	Around of Panjang Port	COLUMBIA			Panjang Port,Bandar Lampung	Tg. Padan Port,Riau	Burned & Sank		the ship was contents of the fertilizer
19	Aug 19,1997	Brantas river,Surabaya		Dugout	6 x 2.5 m	on the south side (Karah)	on the north side (Gunung Sari)	Sank	14 dead,11 alive,4 missed,2 treated at hospital	
20	Oct 1,1997	Musi River	DJISAMSOE & SOOPANOVA INTER 2 BILIZER	Pioner Ship & General Cargo Ship	5000 NT		Mariana & Jakarta	the CargoShip strucked the Pionership & upside down	9 dead,39 alive from 38 passengers	
21	Oct 19,1997	Kapuas River	ERIKA T-I	PionerShip & Tugboat		Dadahup Kapuas,West Kalimantan	Marabah, South Kalimantan	Crashed	27 dead, 3 missed, 32 allive	
22	Oct 22,1997	Musi River	SLAMET VII & SWAKARSA I	Tanker & Motor Boat	800 DWT & 6000 DWT		Palembang	Crashed & Sank		
23	Oct 23,1997	Musi River	ADIJAYA PUTRA & EXPRESS BAHARI 3	Speedboat & Express Ship		Sungsang	Palembang	Crashed & Sank	1 missed, 6 injured	
24	Oct 24,1997	Musi River	FATMAWATI & SAMBUNG RASA III	Tanker & General Cargo Ship				Crashed & Sank		
25	Nov 2,1997	Bukit Kunci Sea, Bayur Bay Padang	KERINCI	Motor Boat		Sibolga Port, North Sumatera	Jakarta	strucked the coral & shipwrecked		
26	Nov 2,1997	Sea of Bangka Island	MV DOO YANG & BOSTA KAYUNG 5	TugBoat	4000 ton	Singapura	Palembang & Jambi	Sank	3 missed,5 alive	
27	Nov 14,1997	Sea of Perak Island, Malaysia		Barge		Bukit Minyak Juru Pulang, Penang	Tg. Pura Langkat, North Sumatera	Sank	22 missed,18 alive	
28	Nov 14,1997	MaroKumbe Waters of Merauke	MV ALAM SAMUDERA	Motor Boat		Merauke		sank	16 survived, 3 dead	
29	Nov 20,1997	Mahakam river,East Kalimantan	LEUSER & KAYU LAPIS V	Motor Boat & General Cargo Boat	6022 ton & 3936 ton	Samarinda Port	Toli Toli	Crashed	4 minor injury,712 alive	
30	Nov 21,1997	Tg. Tembaga Port, Probolinggo		Motor Boat & SailBoat				Burned	43 ships burned in Tg. Tembaga Port	

Appendix 2.7.6. Verification of DGSC's Marine Casualty Data by Scrap in 1997

NO	DATE	DIACE			ABOUT SHIP				CDITEDIA	VICTIM	DESCRIPTION
NU	DATE	FLACE	NAME	TYPE	SIZE	FROM	TO	ACCIDENT	CKITERIA	VICTIM	DESCRIPTION
31	Nov 24,1997	Micronesia Waters		Canoe		Manado		the canoe w 3000 km	ashed away for	4 alive from 13 passenger	
	Source:	The Jakarta Po REPUBLIKA Bisnis Indonesi Merdeka Antara	st a	KOMPAS Media Indone Suara Pemba Angkantan B	sia ruan ersenjata	SUARA K Rakyat M Business Pelita	CARYA erdeka News		Remarks: not showed Data in Ap	Patterned Data means tha d in the DGSC's Marine Co pendix 2.7.1.	at it is asualty
				N	lo. of Cas	1997 e Dead M	issing Tot	al]		

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Appendix 2.7.7. Verification of DGSC's Marine Casualty Data by Scrap in 1998

NO	DATE	PLACE	NAME	TYPE	ABOUT SHIP SIZE	FROM	TO	AC	CIDENT CI	RITERIA	VICTIM	DESCR	RIPTION
1	Jan 22,1998	Labuangkallo (Pasir) waters of Makassar Strait	RAHMAT SEJATI	Motor Boat		Tanah Grogot	Kandillo river Tanjung Aru Village	Sanl	k		1 missed, 12 dead,42 alive		
2	Jan 24,1998	Tg. Datuk Waters off Riau	SAMBU SAKTI	Motor Boat		CongCong Luar, Inhil	Panjang Strait, Bengkalis	Sanl	k		57 missed, 25 dead, 32 alive		
3	Feb 3,1998	Benoa Port,Denpasar	PUTRA JAYA	Motor Boat				Buri	ned				
4	Feb 7,1998	Thousand Island waters	DARMA MAJU	Trolling Ship		Muara Angke,North Jakarta	Mesuji Waters,South Sumatera	Ship	owrecked		4 missed,5 alive		
5	Feb 12,1998	on the sea	PUTRI NURSABAH	Motor Boat	16 DWT	Ambon Island	Ambalau Island	the s the s	ship adrift & sea	& buffeted in	51 alive,the captain missed	the captain help	was looked for
6	Jun 25,1998	Alas Strait,Nusa Tenggara Barat	BAHANA NUSANTARA	Ferry	27.74 m x 7.8 m, 375 ton	Pototano, Sumbawa	Kayangan Port,Lombok	San	k		21 dead,21 missed,52 alive		
7	Jun 29,1998	Rimau Balak Island, Bakauheni	MENGGALA	Motor Boat		Merak	Bakauheni	Ship	owrecked				
8	July 12,1998	Way Mesuji river		SpeedBoat				Sanl	k		2 missed, 25 alive		
9	Aug 17,1998	Malaka Strait	SINABUNG & WORLD NORD	Motor Boat & Panama Tanker		Belawan & Singapura	Tg. Priok & Spanyol	Cras	shed		4 dead, 4 injured		
10	Aug 17,1998	Around of Seribu island & Cituis fishery Port	KRISNA 1	Motor Boat		Lancang Island,Seribu Islands	Cituis Tangerang ,Fishery Port	Sanl	k		7 dead,9 missed,20 injured		
11	Aug 22,1998	Malaka Strait	DEWI MAS	Motor Boat	494 GT	Penang Island, Malaysia	Belawan Port	Mis	sed		15 crews missed		
12	Aug 25,1998	around of the Pier of Dili Port	DOBONSOLO	Motor Boat		Dili	Ambon	Ship	owrecked				
13	Sept 17,1998	on the north Beach	SEJATI	Tanker & Fishery Motor Boat	9 ton			Cras	shed		1 dead		
14	Oct 22,1998	Sambas river	SUMBER NIAGA I	Motor Boat		Sunda Kelapa Port	Sintete Port	Sanl	k				
15	Nov 6,1998	Bakauheni Port,on the offshore	TITIAN MURNI	PassengerShip		Merak	Bakauheni	Ship	wrecked				
16	Nov 9,1998	Galesong waters off South Sulawesi	ANDRIANI INDAH	Motor Boat		Salamona Island, 10 km from Makassar	Mangindara village, Galesong	Ups	ide down s	hip	4 dead,6 missed,30 alive		
17	Nov 12,1998	Lambasina Island waters of Kolaka,Bone Bay	RAHMAT BUHARI	Ferry	2000 GRT, tonnage 413			the v ship then	waves ramn & the engin sank	ned into the ne stopped	15 dead,10 missed,154 alive		
18	Nov 25,1998	Sunda Strait	NUSA MULYA	Ferry		Merak	Bakauheni	Ship	owrecked				
19	Nov 29,1998	Cilacap Sea	PATRAK JAYA	Motor Boat				the v	waves rolled	l up the ship	4 fisherman dead		
20	Dec 25,1998	Adang Bay,East Kalimantan	SURYA	Motor Boat		Tanah Grogot,Pasir Island	Loading Batubara, Pasir Regency	the s light	ship was str tning	uck by	3 dead,2 burned injury		
21	Dec 25,1998	Brantas river,Surabaya		Dugout		Podoroto Village	Keboan Village	Upsi	ide down sh	ip	2 dead,6 missed,24 alive		
22	Dec 28,1998	Sunda Strait Sea	ADINDA LESTARI 101	Ferry		Bakauheni	Merak	the s	ship went a	ground	5 dead,3 missed,24 alive		
23	Dec 30,1998	Port of Sila Village	REJEKI & HENA RIRI JAYA	Motor Boat		Ambon & Saparua	Nela Heya Village	Cras	sh & sank		5 dead,	Rejeki's shij	p sank
Г	Courses	The Jake-t- D	ost	KOMDAS		SUADA				(•	1
	Source.	REPUBLIKA	USL	Media Indon	esia	Rakvat N	Verdeka			Remarks:	Patterned Data means th	atit is	
		Bisnis Indones	ia	Suara Pemba	aruan	Business	s News			Data in An	nendix 271	asually	
		Merdeka		Angkantan E	Bersenjata	Pelita					ponos(£./		

1998 Unlisted in the DGSC Marine Casualty Data List No. of Case Dead Missing Total 79 16 93 172

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Appendix 2.7.8. Verification of DGSC's Marine Casualty Statistic by Scrapped Data in 1999

NO	DATE	DIACE			ABOUT SHIP			ACCIDENT CRITERIA	VICTIM	DESCRIPTION
NU	DATE	PLACE	NAME	TYPE	SIZE	FROM	TO	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
1	Feb 6,1999	Southest China Sea	HARTA RIMBA	SailBoat	147 ton, 30 x 10 m	Kuala Sambas	Pekan Baru,Riau	Sank	19 passenger & Captain alive,19 dead from 325 passenger,7 crews	
2	Feb 7,1999	Around of Kalumpang Village	BINA BERSAMA	River Taxi		Kuala Kapuaas	Hinterland Area	Exploded	7 dead, 4 missed	the electricity off & the engine bespattered with gasoline
3	Feb 7,1998		HANAKA	Motor Boat		Pemangkat Port West Kalimantan	Pekan Baru,Riau	Sank	280 missed from 300 passenger	
4	Feb 23,1999	Bakauheni Port	NUSA DHARMA & SENOPATI NUSANTARA	Ferry		on the quay 1st of Bakauheni Port	on the quay 4th of Bakauheni Port	the two ships scraped each other		
5	Feb 27,1999	Benoa Port,Denpasar	Surya Terbit 07,Surya Terang 12,Bahari Kencana	Fishery Boat				Burned	1 burned injury	the ships was released the anchor at Benoa Port
6	May 4,1999	Lembeh Sea	CINTA DAMAI	Motor Boat	10 GT	Batang Dua Maluku	Bitung	Upside down ship	1 dead,12 missed,16 alive from 29 passenger	
7	May 8,1999	Sunda Kelapa Port	SEJAHTERA VIII					Burned	1 burned injury	the engine's ship had broken down
8	May 8,1999	Wowoni Island,South East Sulawesi	PANGEBU	Motor Boat		Biringkasi Port,Pangkep South Sulawesi	Ternate,North Maluku	Sank	10 dead,1 alive.17 missed	
9	Jun 16,1999	Cempedak cape,Wawoni Strait	ILOLO GADING	Motor Boat		Raha	Kendari, South East Sulawesi	Shipwrecked		
10	Aug 11,1999	Paotere Port, Makassar	Duta Karya, Minasa Harapan, Sabar Jaya, Jolor, Surga Abadi, Buah Saudara	Motor Boat				Burned		
11	Sep 20,1999	Tg. Perak Port	SIDULANG	Motor Boat				Exploded	1 dead, 1 missed	the ship was repaired on the port
12	Dec 2,1999	Around of Pakning river, Bengkalis	DUMAI EKSPRESS VI	Ferry	150 ton	Bengkalis	Batam	Exploded & burned	5 dead,6 burned injury from 200 passengers	
ſ	Source	The Jakarta I	Post	KOMPAS		SUARA	KARYA	Dementer	. Dette med Dete merene th	- 4 i4 i-

The Jakarta Post REPUBLIKA Bisnis Indonesia Merdeka Antara KOMPAS Media Indonesia Suara Pembaruan Angkantan Bersenjata SUARA KARYA Rakyat Merdeka Business News Pelita

Remarks: Patterned Data means that it is not showed in the DGSC's Marine Casualty Data in Appendix 2.7.1.

1999 Unlisted in the DGSC Marine Casualty Data No. of Case Dead Missing Total 16 81 114 195

Appendix 2.7.9. Verification of DGSC's Marine Casualty Data by Scrap in 2000

NO	DATE	PLACE	NAME	TYPE	ABOUT SHIP	FROM	то	ACCIDENT CRITERIA	VICTIM	DESCRIPTION
1	Jan 12,2000	on Warokumba Sea,South East Sulawesi	SARTIKA	Motor Boat		Ampera village, Kendari	Warokumba	Sank	6 dead,1 missed,2 alive	
2	Jan 14,2000	Cilincing Sea	JAYA BAKTI	Motor Boat				Crashed	1 fisherman dead & 2 alive	hit and run
3	Jan 17,2000	Tg. Perak Port	TIDAR	Motor Boat				3 passengers fell down from the shipstair, the height is 7 m		
4	Jan 23,2000	Maluku Sea	LINTAS SAMODERA	Motor Boat	15 GT	Molore Port,Center Sulawesi	Kendari, South East Sulawesi	Sank	42 alive from 53 passengers	
5	Feb 12,2000	Bawean sea,Gresik	PERKASA S 2	Motor Boat		Gresik Port	Kumai,West Kalimantan	the waves rammed into the ship & sank	13 crews missed	
6	May 7,2000	on the waters of Ambon island between Tg. Hutumuri & Tg. Tial	MASNAIT	Motor Boat	200 ton	Hunimua, Ambon Island	Waipirit, Seram Island	the ship was battered by huge waves & sank	41 dead,hundred missed	the ship was loaded with 40 tons of cements,20 tons of fertilizer,2 buses & 2 trucks
7	May 16,2000	on the waters of Bui,200 miles from Gresik port	KRI RATEO 702 & IRIS MASAU	Navy ship & general cargo ship				Crashed & KRI Rateo Sank	all crew alive	
8	June 2,2000	In the waters of Tello island, Nias		PassengerShip		Sibarano island			4 dead,24 in hospital	
9	June 7,2000	In the waters of Bali strait	CITRA MANDALA BHAKTI	PassengerShip	432 GRT, 40.4 m X 9.5 m & 1000 PK	Ketapang	Gilimanuk	the ship was battered by huge waves & sank	51 rescued,6 dead,25 missed	the ship was loaded with 9 cars,4 truck
10	June 29,2000	Around of waters of Sahu-Sangir Talaud	CAHAYA BAHARI	Motor Boat		Tobelo,North Maluku	Manado,North Sulawesi	sank	1 dead,10 dead from 500 passenger	the ship was transport 500 refugees from Galela
11	Jul 1,2000	Around of Pomako port, Timika	NURUL FALA	Motor Boat		Makassar	Timika	sank	4 dead, 20 missed,6 alive	
12	July 7,2000	Nipa-nipa Cape	SINAR BONTANG	Sailing boat	103 GT	Seram island	Makassar,South Sulawesi	the ship was run aground		the ship was transport 120 cows etc
13	July 25,2000	on the waters of Penyu bay sea ,Cilacap	МТ НСС		10 X 50 m, 1154 DWT,740 GT	Cilacap	Pare-pare, South Sulawesi	leak & sank	all crew rescued	the ship was contents of 1,000 metric ton liquid asphalt
14	July 31,2000	on the mouth of Kendari Bay	KURNIA	Motor Boat		Kendari	Ereke	the ship was battered by huge waves & sank	5 dead from 32 passengers	
15	Aug 8,2000	Kahayan river,Kapuas		Pionership				Upside down ship	3 police dead,1 missed	
16	Sep 1,2000	on the water of Manipa strait,Maluku	MULYA STAR	Sailing boat		Pelita Jaya Port, Piru West Seram	Probolinggo	the huge waves & strong winds rammed into the ship & sank	3 dead,25 alive,16 missed	the ship contents are 20 ton cloves, 100 ton copra
17	Sept 19,2000	on the southest China sea	MV MAJUKARSA	General Cargo ship		Sunda Kelapa port,Jakarta	Pangkalbalam port,Pangkal Pinang	leak & sank	1 crew missed	
18	Oct 3,2000	Around of waters of Suar Batu Berantai	NATUNA SEA	Tanker		Jeddah,Saudi Arabia	China	Leak		the tanker contents 526,000 barel crude oil
19	Oct 11,2000	Between Mor island & Jauman,3 km from Nabire city,Irian Jaya	UMSINI	Motor Boat	120 m	Serui, Yapen Waropen District	Nabire	the ship strucked the coral & ran aground		
20	Oct 22,2000	Manado bay	BAHTERA	Motor Boat		Kalijengki port	Bunaken island	the huge waves & strong winds rammed into the ship	1 dead,1 missed,48 alive	
21	Nov 19,2000	Around of 200 m from Depok beach, Parangtritis,Yogyakarta	SRI LESMONO	Fishery Ship				the ship was battered by huge waves & sank	1 missed,2 alive	
22	Dec 7,2000	Around of waters of P.Kahatola, north side of Halmahera	HASIL KARYA 2	Sailing boat	6 GT	Ternate	Tobotobo village & Dama	the ship was battered by huge waves & missed	19 dead, from 135 passengers	
23	Dec 14,2000	Mahakam river,East Kalimantan	SURYA KALIMANTAN 2	River Taxi		Longbagun subdistrict, west Kutai	Samarinda	sank	18 dead from 62 passengers	
24	Dec 31,2000	Mahakam river,East Kalimantan		Motor Boat		Handil	Sidondang village	sank	8 dead,5 alive	

Source: The Jakarta Post REPUBLIKA Bisnis Indonesia Merdeka Antara KOMPAS Media Indonesia Suara Pembaruan Angkantan Bersenjata SUARA KARYA Rakyat Merdeka Business News Pelita Remarks: Patterned Data means that it is not showed in the DGSC's Marine Casualty Data in Appendix 2.7.1.

	20	00		
Unlisted in the D	GSC Ma	arine Casualt	y Data List	
No. of Case	Dead	Missing	Total	
17	14	72	86	

1N0.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of	Victims	Loading Loss	Remarks
1	07-Jan-91			06-42-205	112-12-50	1027*	P	Indonesia	Accident	Nil	(Ton) 860T	too big as
- 1	07-Jaii-91		Gosong Batu Putih Pu	00-42-203	100 50 00	1321	T 1 T .	Indonesia/Indo	Suiken	NII	8001	too big as
2	09-Jan-91		Karimun Jawa	06-06-00S	108-50-00	2879*/200*	Tanker/Tug	enesia	Sunken	Nil	Nil	
3	19-Jan-91			05-01-00S	106-34-00	413*	Cargo	Indonesia	Sunken	Nil	10t	
4	19-Jan-91			02-12-08S	105-27-02	4350*	Chemical	Indonesia	Expladed	Nil	Nil	Dameged hull
~	00 5 1 01			01 10 000	104.00.55	4213*/1839		Indonesia/Indo	G 11: 1	N.1-1	N.1-1	
5	06-Feb-91		Selat Bangka	01-13-205	104-02-55	*	Barges /Barge	enesia	Collision	Nil	Nil	
6	06-Feb-91			00-50-50S	104-24-00	19*	Cargo	Indonesia	Sunken	5	Nil	Load total loss
7	12-Feb-91			04-32-30N	1998/3/14		Kapal Motor	Indonesia	Sunken	17	Load total loss	Car ferry or
8	23-Feb-91			05-49-00S	107-19-00	489	Cargo	Indonesia	Sunken	Nil	Nil	Total loss
9	25-Mar-01			04-43-395	110-22-05	3718*/1990	Tanker/Fishin	Indonesia	Collision	Nil/1	Nil/Nil	
0	20 10101 01			01 10 005	110 22 00	*	g boat	muonesia	Ethilit	14101	THEFT	
10	07-Apr-91		Sungai Batanghari Jambi	01-43-16S	127-50-50	1502*	Cargo	Indonesia	Fire and	Nil	Total loss	
11	01-May-91			04-24-00S	124-07-00	1447*	Cargo	Indonesia	Sunken	4	Total loss	
12	15-May-91			06-13-00S	112-59-00	795*	Cargo	Indonesia	Sunken	Nil	Nil	
13	28-May-91			00-32-40S	101-27-10	234*/84*/1		Indonesia	Collision	Nil	Nil	
						9* 5029/106*/	Cargo/Tug/Bar	Indonesia/Indo				
14	16-Jun-91		Kapalauan Aru Irianjaya	03-50-49N	98-44-14	1257*	ge	enesia	Collision	3	Nil	
15	26-Jun-91			06-45-10S	106-49-50	1266*	Cargo	Indonesia	Sunken	Nil	925T	
16	03-Jul-91			02-0-40	101-11-04	355*/4101*	tug/Barge	All Indonesia	Sunken	6	Nil	
17	16-Aug-91			01-05-10S	123-13-30	2054*/74.7	Tanker/Cargo	Indonesia	Collision	Nil	Nil	
18	06-Sep-91			04-38-31S	153-07-04	14036*	Cargo	Indonesia	Terdmpar	Nil	Nil	
10	27 Oct 01			02 20 205	105 26 40	6631*/2768	Cargo/Cargo	Indonesia/Indo	Collision	Nil	Nil	
19	27-001-91			02-20-203	103-30-40	*	Cargo/Cargo	enesia	Comsion	INII	INII	
20	31-Oct-91			03-10-00S	101-00-00	3635	Cargo	Indonesia/Indo	Sunken	Nil	Nil	
								enesia	Overthrow			
21	21-Nov-91			07-43-01S	136-43-00	560*	Fishing boat	Indonesia	sunken	2	Total loss	
22	01- Jan-92			01-08-04N	101-29-27	19 8*/3003	Motor	Indonesia /	Collision	Nil	Nil	
~~~	01-5411-52			01-00-0411	101-23-27	15.0 /5005	boat/Cargo	singapere	L	NII	1 VII	
23	17- Jan-02			00-21-025	103-30-02	176	Cargo	Indonesia	Leak / Stranded her	Nil	Nil	abandonment
23	17-5411-52			00-21-025	103-33-02	170	Cargo	muonesia	self	1 VII	1 Mi	of vessel
24	22-Jan-92			04-41-40S	118-55-20	2492	Cargo	Indonesia	Stranded	Nil	Nil	
25	23-Jan-92			06-20-00S	113-20-00	402*	Cargo	Indonesia	Sunken	Nil	?	
26	23-Jan-92			00-54-00S	103-45-03	49	Ferry	Indonesia	Sunken	8	total loss	
27	31-Jan-92			06-30-03S	129-29-00	387*	Cargo	Indonesia /	Sunken	Nil	Nil	
28	11-Mar-92			02-09-00	105-05-25	*	Cargo/Tanker	Indoenesia	collision	Nil	Nil	
20	06 App 02			00 22 255	101 20 27	09.01*	Cango	Indonesia	Fire	1	NH	Total loss by
29	00-Apr-92			00-33-333	101-29-27	96.91	Cargo	muonesia	Sunken	1	INII	fire
30	12-Apr-92		Selat Makassar	03-39-42S	112-27-54	463*	Tug boat	Indonesia	Membentur	Nil	Eng. Dameged	
31	-						-		Benda Keras			
	31-May-92			04-34-305	106-41-30	483*	Cargo	Indonesia	Sunken	Nil	Nil	
1	31-May-92			04-34-30S	106-41-30	483*	Cargo Tanker/Bantu	Indonesia	Sunken	Nil	Nil	
32	26- Jun-92			04-34-30S	106-41-30	483* 26499*/168	Cargo Tanker/Bantu Peramban(Ins	Indonesia Indonesia/Indo	Sunken	Nil Nil/Nil	Nil	DisVNav.
32	26-Jun-92			04-34-30S 07-12-09S	106-41-30 112-39-06	483* 26499*/168 *	Cargo Tanker/Bantu Peramban(Ins pection boat	Indonesia Indonesia/Indo enesia	Sunken Collision	Nil Nil/Nil	Nil Nil/Nil	DisVNav. Surabaya
32	31-May-92 26-Jun-92			04-34-30S 07-12-09S	106-41-30 112-39-06	483* 26499*/168 *	Cargo Tanker/Bantu Peramban(Ins pection boat for light house	Indonesia Indonesia/Indo enesia	Sunken Collision	Nil Nil/Nil	Nil Nil/Nil	DisVNav. Surabaya
32 33	26-Jun-92 28-Jun-92			04-34-30S 07-12-09S 01-02-02N	106-41-30 112-39-06 102-06-06	483* 26499*/168 * 1436/17*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat	Indonesia Indonesia/Indo enesia Singapere/ind onesia	Sunken Collision Collision	Nil/Nil 1/nil	Nil Nil/Nil Nil/Nil	DisVNav. Surabaya
32 33 34	31-May-92 26-Jun-92 28-Jun-92 28-Jun-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S	106-41-30 112-39-06 102-06-06 116-20-00	483* 26499*/168 * 1436/17* 56*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia	Sunken Collision Collision Sunken	Nil Nil/Nil 1/nil 21	Nil Nil/Nil Nil/Nil Nil	DisVNav. Surabaya
32 33 34 35	31-May-92 26-Jun-92 28-Jun-92 28-Jun-92 29-Jun-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00	483* 26499*/168 * 1436/17* 56* 361*/260*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia Indonesia/sing	Sunken Collision Collision Sunken Sunken	Nil Nil/Nil 1/nil 21 Nil	Nil Nil/Nil Nil/Nil Nil	DisVNav. Surabaya
32 33 34 35	31-May-92 26-Jun-92 28-Jun-92 28-Jun-92 29-Jun-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00	483* 26499*/168 * 1436/17* 56* 361*/260*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia Indonesia/sing apere	Sunken Collision Collision Sunken Sunken	Nil Nil/Nil 1/nil 21 Nil	Nil Nil/Nil Nil/Nil Unnknown	DisVNav. Surabaya
32 33 34 35 36	31-May-92 26-Jun-92 28-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825*	Cargo Tanker/Bantu Peramban(Ins pection boat <u>for light house</u> Tanker/Motor <u>boat</u> Passenger Barge/Tug Cargo /Cargo	Indonesia/Indo enesia Singapere/ind onesia Indonesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision	Nil Nil/Nil 1/nil 21 Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed	Indonesia/Indo enesia Singapere/ind onesia Indonesia/Indo enesia/Indo enesia	Sunken Collision Collision Sunken Sunken Collision	Nil Nil/Nil 1/nil 21 Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44 114-16-00	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed	Indonesia/Indo enesia Singapere/ind onesia Indonesia/Indo enesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil	Nil Nil/Nil Nil/Nil Unnknown Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44 114-16-00	483* 26499*/168 * 1436/17* <u>56*</u> 361*/260* 493*/825* 6.16*3	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat	Indonesia Indonesia/Indo enesia Singapere/Ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil	Nil Nil/Nil Nil/Nil Unnknown Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44 114-16-00	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat Cargo/Kapel Melavan	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision	Nil Nil/Nil 1/nil 21 Nil 1/nil	Nil Nil/Nil Nil/Nil Unnknown Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 00-04-00S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44 114-16-00 108-53-50	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil Nil/1	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 00-04-00S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Bassenger Barge/Tug Cargo /Cargo Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Sunken Sunken Collision Collision	Nil Nil/Nil 1/nil 21 Nil 1/nil Nil/1	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 00-04-00S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil Nil/1	Nil Nil/Nil Nil Unnknown Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 39	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 00-04-00S 05-09-00S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00	483* 26499*/168 * 1436/17* <u>56*</u> 361*/260* 493*/825* 6.16*3 1045*75* <u>530*</u>	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor	Indonesia Indonesia/Indo enesia Singapere/Ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo	Sunken Collision Collision Sunken Collision Collision Collision	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil Nil/1 Nil/1	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 00-04-00S 00-04-00S 04-26-05N	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44 114-16-00 108-53-50 113-29-00 119-16-05	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 0458*2025*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo	Indonesia Indonesia/Indo enesia Singapere/Ind onesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Sunken Sunken Collision Collision Collision Sunken Stranded	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil Nil/1 Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92 14-Oct-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 00-04-00S 05-09-00S 04-26-05N 02-04-02S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 *	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge	Indonesia Indonesia/Indo enesia Indonesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Sunken Collision Collision Collision Collision Collision Sunken Stranded Sunken	Nil Nil/Nil 1/nil 21 Nil Nil 1/nil Nil/1 Nil Nil Nil Nil Nil Nil	Nil Nil/Nil Nil Unnknown Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92 14-Oct-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 00-04-00S 04-26-05N 02-04-02S	106-41-30 112-39-06 102-06-06 116-20-00 114-19-00 112-44-44 114-16-00 108-53-50 113-29-00 119-16-05 105-02-03	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 *	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Bassenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge	Indonesia Indonesia/Indo enesia Indonesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo	Sunken Collision Sunken Sunken Collision Collision Collision Sunken Stranded Sunken One ship	Nil Nil/Nil 21 Nil Nil 1/nil Nil/1 Nil Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 00-04-00S 04-26-05N 02-04-02S 03-33-55	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 * 2812*/408*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Bassenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Sunken Sunken Collision Collision Collision Sunken Stranded Sunken One ship sunken owin	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 40 41 42	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92 14-Oct-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 00-04-00S 04-26-05N 02-04-02S 03-33-55	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 * 2812*/408*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia/Indo enesia	Sunken Collision Sunken Sunken Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 40 41 42 43	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 02-04-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo/Cargo Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo	Indonesia Indonesia/Indo enesia Singapere/ind onesia Indonesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo	Sunken Collision Collision Sunken Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Sunken	Nil Nil/Nil 21 Nil Nil 1/nil 1/nil Nil/1 Nil Nil Nil Nil Nil 32	Nil Nil/Nil Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42 43 44	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92 26-Dec-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 02-44-00S 02-04-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo	Indonesia Indonesia/Indo enesia Singapere/Ind onesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia	Sunken Collision Collision Sunken Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Collision Collision	Nil Nil/Nil 21 Nil Nil 1/nil 1/nil Nil/1 Nil Nil Nil Nil Nil 32 Nil/7	Nil Nil/Nil Nil/Nil Unnknown Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 39 40 41 41 42 43 44	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92 26-Dec-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 00-04-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia	Sunken Collision Collision Sunken Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken ovin to collision Sunken Collision Sunken Collision Sunken	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42 43 44	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92 29-Dec-92		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Cullision Sunken Collision	Nil Nil/Nil I/nil I/nil I/nil Nil Nil Nil Nil Nil Nil Sil Sil Nil Nil Nil Nil Nil Nil Nil Nil Nil N	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42 43 44 45 46 47	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92 26-Dec-92 29-Dec-92 29-Dec-92 29-Dec-92		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 05-13-00S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 05*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Sunken Collision Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Sunken Collision Sunken Sunken Sunken Sunken	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42 43 44 45 46 47 48	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 14-Oct-92 22-Dec-92 26-Dec-92 29-Dec-92 28-Jan-93 29-Jan-93 29-Jan-93		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 05-13-00S 01-40-00S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30           109-35-50	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat/Speed boat/Speed boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor Ship Cargo Cargo Cargo Cargo Cargo Cargo Layar Motor	Indonesia Indonesia/Indo enesia Singapere/Ind onesia Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia	Sunken Collision Sunken Collision Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Collision Sunken Collision Sunken Su	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 19-Jul-92 20-Sep-92 07-Oct-92 14-Oct-92 14-Oct-92 22-Dec-92 26-Dec-92 28-Jan-93 03-Feb-93		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 05-13-00S 01-40-00S 05-30-39S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30           109-45-50           105-33-40	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 2872/07202	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Bassenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo Cargo Cargo Cargo Cargo Cargo Cargo Layar Motor	Indonesia Indonesia/Indo enesia Indonesia Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia	Sunken Collision Sunken Collision Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken ovin to collision Collision Sunken Collision Sunken Sunken Sunken Sunken Sunken Sunken Sunken	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 39 40 41 41 42 43 44 45 46 47 48 49	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 26-Dec-92 26-Dec-92 29-Dec-92 28-Jan-93 03-Feb-93 22-Feb-93		Pulau Sekala Kangean Barito river/near BJM	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 02-04-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 05-13-00S 01-19-42S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30           109-45-50           105-35-40	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 1045*75* 1045*75* 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo Cargo Cargo Cargo Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia	Sunken Collision Collision Sunken Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Sunken Collision Sunken Sunken Collision Sunken Sunken Sunken Collision Sunken Collision Sunken Collision Sunken Collision Sunken Collision Sunken Collision Sunken Sunken Collision	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92 26-Dec-92 29-Dec-92 29-Jan-93 03-Feb-93 22-Feb-93		Pulau Sekala Kangean	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 02-04-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 05-13-00S 01-19-42S	106-41-30           112-39-06           102-06-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30           109-45-50           105-35-40	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733* /65	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat/Speed boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo Cargo Cargo Cargo/Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/sing apere Indonesia/sing Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia	Sunken Collision Collision Sunken Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin Sunken Collision Sunken Collision Sunken Collision Sunken Collision	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32           33           34           35           36           37           38           39           40           41           42           43           44           45           46           47           48           49           50	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 19-Jul-92 20-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 26-Dec-92 28-Jan-93 03-Feb-93 22-Feb-93 28-Feb-93		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 05-13-00S 01-40-00S 05-30-39S 01-19-42S 01-10-10N	106-41-30           112-39-06           112-39-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           1105-03-51           105-35-51           102-09-15	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733* /65 98*/1912*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo Cargo Layar Motor Cargo/ Cargo/	Indonesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo esia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia/Indo	Sunken Collision Collision Sunken Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken ovin Collision Collision Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken Collision Collision	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42 43 44 45 46 47 48 49 50 51	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 19-Jul-92 11-Sep-92 20-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 26-Dec-92 28-Jan-93 03-Feb-93 22-Feb-93 19-Mar-93		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 01-40-00S 05-30-39S 01-19-42S 01-10-10N 03-35-20S	106-41-30           112-39-06           112-39-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           116-53-51           102-09-15           127-54-30	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733* /65 98*/1912* 18	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo Cargo/Cargo Layar Motor Cargo/ Cargo/Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia	Sunken Collision Collision Sunken Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Sunken Collision Sunken Collision Collision Collision Collision Collision Overthrowed	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil           9           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 38 39 40 41 41 42 43 44 45 46 47 48 49 50 51	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 16-Oct-92 22-Dec-92 28-Jan-93 03-Feb-93 22-Feb-93 28-Feb-93 19-Mar-93		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM Dermaga Pel	04-34-30S 07-12-09S 01-02-02N 06-58-00S 05-00-00S 06-51-30S 02-44-00S 02-44-00S 04-26-05N 02-04-02S 03-33-55 02-34-20N 07-08-25S 01-41-20S 01-40-00S 05-30-39S 01-19-42S 01-10-10N 03-35-20S	106-41-30           112-39-06           112-39-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           109-45-50           105-35-40           116-53-51           102-09-15           127-54-30	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733* /65 98*/1912* 18	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor boat Passenger Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat Cargo/Kapel Melayan Laut(Inspectio n boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo Cargo Cargo/Cargo Barge/Tug Cargo Cargo/Cargo Layar Motor Cargo/Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/Sing apere Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia/Indo esia	Sunken Collision Sunken Collision Collision Collision Collision Collision Collision Sunken Sunken One ship sunken owin to collision Sunken Collision Sunken Sunken Collision Collision Collision Collision	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil/Nil Unnknown Nil	DisVNav. Surabaya
32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 14-Oct-92 26-Dec-92 28-Jan-93 29-Jan-93 03-Feb-93 22-Feb-93 19-Mar-93 21-Mar-93		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM Dermaga Pel Penyeberangan Jangkar	04-34-30S           07-12-09S           01-02-02N           06-58-00S           05-00-00S           06-51-30S           02-44-00S           00-04-00S           04-26-05N           02-04-02S           03-33-55           02-34-20N           07-08-25S           01-41-20S           05-13-00S           01-40-00S           05-13-00S           01-40-00S           05-30-39S           01-19-42S           01-10-10N           03-35-20S           07-01-00S	106-41-30           112-39-06           112-39-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30           109-45-50           105-35-40           116-53-51           102-09-15           113-0900	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733* /65 98*/1912* 18 2867*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat/Speed boat/Speed boat/Speed boat for lighthouse Layar Motor Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Tug Cargo Cargo/Cargo Layar Motor Cargo/Cargo Layar Motor Cargo/Cargo Cargo/Cargo Cargo/Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia/Sing apere Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia	Sunken Collision Sunken Collision Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Sunken Collision Sunken Collision Collision Collision Collision Collision Sunken	Nil           Nil/Nil           1/nil           21           Nil           1/nil           1/nil           Nil/1           Nil	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya
32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52	31-May-92 26-Jun-92 28-Jun-92 29-Jun-92 05-Jul-92 19-Jul-92 19-Jul-92 11-Sep-92 07-Oct-92 14-Oct-92 28-Dec-92 28-Jan-93 03-Feb-93 29-Jan-93 22-Feb-93 228-Feb-93 28-Feb-93 21-Mar-93		Pulau Sekala Kangean Pulau Sekala Kangean Barito river/near BJM Dermaga Pel Penyeberangan Jangkar Situbundo,Jatim	04-34-30S           07-12-09S           01-02-02N           06-58-00S           05-00-00S           06-51-30S           02-44-00S           00-04-00S           05-09-00S           04-26-05N           02-04-02S           03-33-55           02-34-20N           07-08-25S           01-41-20S           05-30-39S           01-19-42S           01-10-10N           03-35-20S           01-10-10NS	106-41-30           112-39-06           112-39-06           116-20-00           114-19-00           112-44-44           114-16-00           108-53-50           113-29-00           119-16-05           105-02-03           114-28-55           128-20-00           112-39-50           106-07-40           117-44-30           109-45-50           105-35-40           116-53-51           102-09-15           127-54-30           113-0900	483* 26499*/168 * 1436/17* 56* 361*/260* 493*/825* 6.16*3 1045*75* 530* 10634* 3152*/6605 * 2812*/408* 45.15* 112*/4118* 116*/107* 2290* 95* 174 3373/2733* /65 98*/1912* 18 2867*	Cargo Tanker/Bantu Peramban(Ins pection boat for light house Tanker/Motor Barge/Tug Cargo /Cargo Speed boat/Speed boat/Speed boat/Speed boat/Speed boat/Speed boat/Speed boat for lighthouse Lavar Motor Cargo/Cargo Barge/Barge Tanker/Motor ship Cargo Cargo/Cargo Barge/Cargo Cargo/Cargo Lavar Motor Cargo Cargo/Cargo Lavar Motor Cargo/Cargo Cargo/Cargo Lavar Motor Cargo/Cargo Cargo/Cargo Cargo/Cargo Cargo/Cargo Cargo/Cargo	Indonesia Indonesia/Indo enesia Indonesia Indonesia Indonesia/Sing apere Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo enesia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia Indonesia/Indo esia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia Indonesia	Sunken Collision Sunken Collision Collision Collision Collision Sunken Stranded Sunken One ship sunken owin to collision Sunken Collision Sunken Sunken Sunken Collision Collision Collision Collision Collision Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken Sunken	Nil           1/nil           21           Nil           1/nil           1/nil           1/nil           Nil/1           Nil           Nil	Nil Nil/Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	DisVNav. Surabaya

No.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
54	26-May-93		Pier of Tg.Priok port	04-35-00S	107-00-00	466	Cargo	Indonesia	Sunken owing to fire	Nil	total loss	
55	25-Jun-93		Southern Part of Masalembo Is	02-18-00S	106-25-00	847*	Cargo	Indonesia	Stranded	Nil	leak	1995 no.10
56	14-Jul-93		inabalembo ibi	05-55-20S	105-48-40	590	Tanker	Indonesia	Stranded	Nil	5t	
57	19-Sep-93	11:05	Mahakam River	00-35-52S	117-17-30	4 */ 6 *	Speed Boat / Speed Boat	Indonesia / Indonesia	Collision	Nil	Nil	
58	08-Oct-93		Mahakam River	02-32-21S	140-43-13	584	Cargo	Indonesia	Stranded	Nil	total loss	
59	11-Oct-93			06-04-30S	110-30-30	63.5*	Passenger	Indonesia	sunken	35 N#I	total loss	
61	23-Oct-93 31-Oct-93		Pier of Sangkapura	00-38-30S	105-41-00	555*	Ferry	Indonesia	Stranded	Nil	dameged	1995 no.11
62	16-Nov-93	22:00	Bawean Is's port near Laut Is.	03-58-00S	115-46-00	6 / No Data	Fishing Boat /	Indonesia	Collision and	Nil /	Nil /	/ Hit and run
63	14-Dec-93		Perairan Tg. Jang	05-21-00S	113-41-00	1239*	Cargo	Indonesia	Sunken /	?	?	1995 p-60
64	23-Dec-93	17:30	Off Cilacap	07-48-00S	109-05-00	42 *	Fishing Boat	Indonesia	Stranding	Nil	Nil	
65	19-Jan-94	20:15	Bali Strait	08-03-20S	114-31-00	275	Ferry	Indonesia	Sunken Main Engine	51	100	
66	21-Feb-94	08:00	Flores Sea	07-29-10S	122-10-00	562	Cargo	Honduras	Trouble	Nil	Nil	
67	23-Feb-94	23:10	SE of Sulawasi Is.	05-40-00S	118-42-20	337 *	Cargo	Indonesia	Sunken	Nil	175	
00	23-FeD-94	02.23	Di CTI D	02-32-403	129-29-00	127	Fishing Boat	Indonesia /	C III I	1	INII N'I	/ Under
69	20-FeD-94	07:00	Pier of 1g. Perak	07-11-525	112-43-42		Passenger	Indonesia	Collision	INII	INII	mooring
70	01-Mar-94	03:30	Jawa Sea	06-08-10S	111-10-10	117	Fishing Boat	Indonesia	Die of Crew b/o sick	1	Nil	
71	03-Mar-94	03:03		07-22-00S	120-35-00	6	Cargo	Indonesia	Sunken	Nil	16	
72	04-Mar-94	06.00	near Bangka	01-24-005	120-35-00	108/1421	Tug/Barge	Indonesia/Sin	Load and crew fallen	1	1 800	Trailed by TB
			8				88-	gapore	into sea	-	-,	Merlin (S'pore)
73	05-Mar-94	15:45	Tg. Perak Port	07-11-24S	112-42-43	6,975	Cargo	Indonesia	Sunken	Nil	3,125	
74	10 M 04	14.17	D D	00-30-305	115 14 00	10.400	Cargo	Indonesia	Flooding &	INII NT21	INII NT21	Collide to No
/5	10-Mar-94	14:15	Benoa Port	08-45-035	110-14-00	10,483	Cargo	Indonesia	Stranding	INII	INII	Data object
76	16-Mar-94	13:05	Channel	07-11-36S	112-44-06	398 */ 757 *	Cargo / Ferry	Indonesia / Indonesia	Collision	Nil	Nil	
77	20-Mar-94	19:30		00-55-45N	104-22-10	6	Speed Boat	Indonesia / Indonesia	Collision	Nil	Nil	
78	29-Mar-94	06:00	Off Central Sulawesi Is.	02-48-00S	118-35-00	282	Cargo	Indonesia	Fire	Nil	50 NH	
80	03-Apr-94 04-Apr-94	04:20		03-36-30IN 08-21-00S	110-50-00	3,230	Fishing Boat	Indonesia	Collision	1 / No	Nil / No Data	Hit and run
81	09-Apr-94	22:05	Pekanbaru Port	00-30-18N	101-20-42	453	Cargo	Indonesia	Sunken	Nil	515	
82	15-Apr-94	21:30	Pier of Tg. Perak	07-12-23S	112-43-26	3350 *	Cargo	Indonesia	Sunken	Nil	Nil	
0.1	19-Apr-94	02.14	G	00-31-301	110.00.00	2,000	Boat / Speed	Indonesia /			INII N'I	
84	22-Apr-94	00.45	Sampit River	02-38-005	113-08-00	3/2	Boat	Indonesia	Collision	INII / I	INII	
85 86	23-Apr-94 23-Apr-94	03:15	Near south Kalimantan	03-51-30N 06-16-00S	114-22-00	395 * 468 *	Cargo	Indonesia	Fire	Nil	Nil 155	
87	27-Apr-94	14:30	Channel to Pontianak	00-04-00N	109-08-30	125 * / No	Cargo / Row	Honduras / No	Collision	Nil/1	Nil	/ Sunken
						Data	Boat Cargo /	Data (IND) Indonesia /				
88	29-Apr-94	04:00	Mahakam River	00-32-42S	117-09-57	100 */ 43 *463*	Cargo/Passeng er	Indonesia /Indonesia	Collision	6 / Nil	1 / Nil	Sunken /
89	30-Apr-94	06:45	Indrapura Sri Siak River	001-51-33N	102-02-10	2,350 * / 97 +1.399	Cargo / Tug Boat + Barge	Indonesia / Singapore	Collision	Nil	Nil	
90	02-May-94	12:35	Merauke Port	08-32-00S	140-28-00	3,162	Cargo	Indonesia	Drifting	Nil	Nil	
91	05-May-94	06:00	Makassar Strait	02-40-00N	124-00-00	459	Cargo	Honduras	Fire	Nil	Nil 150 of cours	
32	14 May 04	08.30	near No.2 Buoy at West	02-12-303	114 97 07	6 099	Cargo	Indonesia	Stronding	NI	NSI	
93	14-May-94	10.00	side of Sei Barito Channel	03-30-423	114-27-07	0,022		Indonesia	Stranung	INII	111	
94 95	16-May-94 16-May-94	10:00		02-05-48S	106-27-05	174	Cargo	Indonesia	Sunken	Nil	150 Nil	b/o flooding
96	19-May-94	01:20	near Mandalika Is.	06-23-40S	110-55-10	607	Cargo	Indonesia	Fire	3	Nil	Sunken
									Hydraulic			
97	23-May-94			02-56-00N	096-34-30	343	Tug Boat	Indonesia	Trouble of	Nil	Nil	
00	00.14	11.00	Tri Franci D. 140	00 57 000	110.05.05	0.050	C- · ·	T 1	Rudder	N T+7	N T+1	
98	26-May-94 03-Jun-94	03:00	Tg. Emas Port/Semarang	06-57-00S 02-24-52S	099-51-18	3,258	Container	Indonesia	Fire	Nil	Nil Nil	No shipmaster
100	03-Jun-94	06:30	Off Karimun Jawa	06-50-00S	110-23-00	25	Cargo	Indonesia	Sunken	Nil	150	Timber
101	10 Jun 04	14.90	Joemarang	06.06.005	106 59 00	277 * / 5	Carra / B	Singapore /	Collini	N:1 / 9	NEL / NEL	/ Sumb
101	10-Juil-94	05.00	Off Tubon/Jotim	06-46.005	112 07 00	311 7 3	Cargo / Boat	Indonesia	Sunker	NU / 2	1111 / 1111 62 *	/ Sunken
102	15-Jun 04	05.00	UII TUDair/Jatiiii	01-00-205	102-55 29	6 / No Data	Row Boat /	Indonesia /	Collision	Nil / Nil	Nil / Nil	
103	20 Jun 04	16.90		01-03-203	103-33-38	170 Data	Cargo	Honduras	Strond:	NII / INII	200	Combre-
104	20-Jun-94 21-Jun-94	06:30		03-15-30S	101-27-19	149	Cargo	Indonesia	Sunken	Nil	148	Timber
106	22-Jun-94	16:00	Gresik Port / Surabaya	07-09-24S	112-40-20	402	Cargo	Indonesia	Fire	Nil	165	Sunken
107	22-Jun-94	00:30	Pangkal Balam	02-04-485	106-10-36	472 *	Cargo	Indonesia	Sunker	Nil	Nil 250 *	Timber
108	03-Jul-94	22:00		07-34-00S	115-20-02	295 *	Cargo	Indonesia	Sunken	Nil	222	Timber
110	03-Jul-94	11:10		01-01-36S	100-21-06	910	Cargo	Indonesia	Stranding	Nil	Nil	Flooding
111	03-Jul-94	15:30		01-37-00N 05-53-10S	101-58-30	7	Boat	Indonesia Indonesia	Fire	4	Nil 07	Sunken
112	05-Jul-94	22:00		07-34-03S	115-20-00	160	Cargo	Indonesia	Sunken	Nil	27	Timber
114	05-Jul-94	00:00		05-50-03S	107-02-45	19 * / No	Fishing boat /	Indonesia / No	Collision	3 / No Data	Fishing net /	/ Hit and run
115	06-Jul-94	05:30		01-41-10S	106-07-00	371 *	Cargo	Indonesia	Sunken	Nil	162	Sand
116	17-Jul-94	17:00		00-31-20N	103-38-24	15	Cargo	Indonesia	Sunken	14	Nil	
117	09-Aug-94	14:30		00-34-005	109-44-30	167	Cargo	Indonesia	Sunken Stranding	Nil	484	Pepper /
118	10-Aug-94	z2:10		06-04-00S	107-40-22	85	Wooden Cargo	Indonesia	and Sunken	Nil	8 ton / 150 *	Timber
119	14-Aug-94	04:20		02-46-00N	118-21-00	No Data	Cargo	Indonesia	Fallen to sea	1	Nil	
120	16-Aug-94	13:15	Jamrud Pier of Surabaya	07-11-49S	112-43-36	2,542	Cargo	Indonesia	Fire	Nil	1,000	Cloves

No.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
121	21-Aug-94	01:15	Gosong Sebbald Slelat, Makkasar	05-36-00S	116-45-00	1,409 *	Cargo	Indonesia	Sunken	7	950	
122	25-Aug-94	11:30		05-41-02S	132-51-52	46 *	Passenger and Cargo	Indonesia	Sunken	2	1	
123	26-Aug-94	22:20	Pier of Tg. Priok	06-06-00S	106-53-00	2,758	Cargo	Indonesia	Stranding	Nil	Nil	Over ship's hull
124	28-Aug-94	22:00		05-10-005	111-45-00	168	Cargo	Indonesia	Sunken Flooding and	Nil	350 *	Timber
125	30-Aug-94	04:00	Couth of Mondaliha Ia	07-50-005	107-39-50	208	Cargo	Indonesia	Stranding	Nil	Nil	No lisson
126	31-Aug-94 04-Sep-94	02:00	South of Mandalika Is.	06-24-00S 08-18-10S	123-02-10	416	Cargo	Indonesia	Sunken	Z Nil	Nil	No license
128	07-Sep-94	23:30	Kalimas Pier of Surabaya	07-12-06S	112-44-05	139	Cargo	Indonesia	Sunken	Nil	Nil	
129	10-Sep-94	03:00		07-46-00S	109-18-15	3		Indonesia	Sunken	8	Nil	missing from
130	11-Sep-94	00:00		03-02-00S	106-15-06	69	Cargo	Indonesia	Stranding	Nil	101	stranding position
131	09-Oct-94	09:20	Pier of Tg. Perak Port of Surabaya	07-11-23S	112-42-21	998 / 2,903	Cargo / Cargo	Indonesia / Indonesia	Collision	Nil / 1	Nil / Nil	/ Anchoring
132	15-Oct-94	05:00		06-27-30S	105-42-00	11 * / 6	Fishing Boat	Indonesia	Collision	Nil	Nil	Sunken /
133	22-Oct-94	11:00	Tg.Perak S'baya	07-11-30S	112-43-00	522 / 522	Barge / Barge	Singapore / Singapore		2	Nil	
134	24-Oct-94	Nil	Belawan Harbour Waters	03-47-00S	98-44-00	4,999	Cargo	Indonesia	Stranding	Nil	Nil	
135	28-Oct-94	19:30	Banjarmasin	03-19-58S	114-33-30	86	Barge	Indonseia	Sunken	Nil	Nil	
136	31-Oct-94	02:50		03-36-29S	114-27-39	6,022	Passenger	Indonesia	Stranding	Nil	Nil	
137	31-Oct-94	22:30	near No.2 Buoy at West	07-11-50N	112-43-36	1,161	Cargo	Indonesia	Fire /	Nil	1,500	
138	02-Nov-94		side of Sei Barito Channel	03-36-42S	114-27-07	6,022	~	Indonesia	Stranding	Nil	Nil	
139	08-Nov-94	15:01		01-06-00N	103-43-22	10,792	Cargo Passenger /	Ukraine Indonesia /	Stranding	Nil	Nil	10.1
140	11-Nov-94	00:53		00-35-05N	127-29-05	26	Cargo	Indonesia	Collision	Nil/8	Nil / 3,875	/ Sunken
141	11-Nov-94	20:30		01-20-00S	103-33-20	No Data / 34	No Data / cargo	No Data / Indonesia	Collision	No Data / Nil	No Data / Nil	Hit and run /
142	15-Nov-94	23:00	west Channel Waters of Surabaya	07-09-00S	112-40-30	141	Cargo	Indonesia	Sunken	Nil	202	
143	01-Dec-94		Indian Ocean?	04-53-10SS	106-36-20	4666*	Cargo	Indonesia	Sunken	Nil	total loss	
144	13-Dec-94	19:30	South Sulawasi	04-59-00S	119-13-00	130	Fishing Boat	Indonesia	Die of crew	1	Nil	Sick
145	14-Dec-94	15:00	Northern Part of Bali	08-12-00S	115-30-00	145	Cargo	Indonesia	Stranding	Nil	20	
146	16-Dec-94	13:00	Special Pier of Pertamina	05-58-00S	111-50-08	101	Fishing Boat	Indonesia	Sunken Collision to	Nil	35	
147	23-Dec-94	07:40	/ Waingapu	09-38-00S	120-15-05	498	Tanker	Indonesia	Pier	Nil	Nil	
148	31-Dec-94	15:00	Batanghari Diyar	02-57-005	118-23-00	172	Cargo	Indonesia	Sunken	Nil 1	303 Nil	Dia
149	01-Jan-95	00:30	Dataliglian Kiver	01-08-50N	104-22-00	64	Cargo	Indonesia	Stranding	Nil	60	Die
151	08-Jan-95	07:00		05-22-30S	107-56-00	321	Cargo	Indonesia	Sunken	Nil	399	
152	14-Jan-95	17:00	Sampit Strait / 70 NM to north from Bawean Is.	03-28-00S	113-28-00	80	Cargo	Indonesia	Sunken	Nil	90 *	
153	15-Jan-95	09:00	among Lapang Is., Pantar Is. & Tg. Leur	08-15-00S	123-55-00	No Data	Cargo	Indonesia	Sunken	Nil	5 *	
154	17-Jan-95	08:30	near No 1 Buoy of Barito	07-58-00S	118-55-30	173	Cargo	Indonesia /	Sunken	Nil	200	
155	19-Jan-95	17:52	river channel 24 NM off from east of	0340-00S	114-28-00	499 / 1,412	Cargo / Tanker	Indonesia	Collision	Nil	Nil	
156	20-Jan-95	11:00	Sapudi Is. West of BJM 15 NM off	06-58-005	114-32-00	/	Cargo	Belize /	Engine	4	NII	
157	20-Jan-95		Tg. Putting	03-46-00S	111-50-00	882	Cargo	Manila	Trouble	Nil	Nil	
158	21-Jan-95 23-Jan-95	19:00	North waters of Sapudi Is.	07-00-005	114-20-00	165 252	Cargo	Indonesia	Sunken	Nil 1	60 340	Sunken
160	25-Jan-95	02:00	Atapupu harbor channel	09-00-00S	124-52-00	No Data	Cargo	Indonesia	Stranding	Nil	Nil	Suiken
161	26-Jan-95	03:15		00-45-00N	104-53-05	2,157	Tanker	Indonesia	Stranding	Nil	Nil	
162	28-Jan-95	15:25		00-56-20N	104-23-15	53	Passenger	Indonesia	Fire	Nil	Nil	G 1
163	03-Feb-95 07-Feb-95	10:30		06-38-005	123-40-40	186	Cargo	Indonesia	Fire	Z Nil	40	Sunken
104	07 1 60-33	00.00	Channel - f 11 f	00 00-003	110-20-00	9.950/000	Cargo / Tug	Indonesia /	Sanken	1111	700	1
165	10-Feb-95	18:30	Barito river	03-40-20S	114-28-00	3,256/382 / 2,288	Boat / Tug Boat + Barge	Indonesia / Singapore	Collision	Nil	Nil	
166	12-Feb-95	00:30	NY JI JI OVEN	04-30-01S	120-25-24	456	Cargo and Passenger	Indonesia	Stranding	Nil	Nil	
167	12-Feb-95	01:30	North side of Kalimun Jawa Is.	05-46-00S	110-22-00	39	Tug Boat	Indonesia	Sunken	Nil	Nil	
168	12-Feb-95	21:30	No Data	No Data	No Data	351	Passenger	Indonesia	Fire	Nil	Nil	
169	21-Feb-95	14:40	3 NM off from south of	08-23-00S	120-02-00	No Data	Passenger	Indonesia	Sunken	1	Nil	
170	22-Feb-95	20:35	Kojadol 18. III Flores Sea	01-06-00N	103-43-00	116,403	Tanker	Iran	Stranding	Nil	Nil	
171	22-Feb-95	13:00		04-10-00S	132-42-00	No Data	Passenger	Indonesia	Engine Trouble and	Nil	Nil	
179	04-Mar OF	00.50		05-30-006	121-06-00	87 / 624	Tug Boat /	Indonesia /	drifting Loading goods fallor	Nil / Nil	/ 062	
172	04-10121-55	00.50	27 NM off south of	03-39-003	121-00-00	877034	Barge	Indonesia	to sea		7 903	
173	05-Mar-95	08:30	Manggarai of Tg. Flesko/ Maluku Sea	00-00-00	124-06-00	87	Fishing Boat	Indonesia	Sunken	24	10	
174	21-Mar-95	04:30	Seliu Is.	03-13-00S	107-32-00	186	Cargo	Indonesia	Broken and Sunken	Nil	236	
175	21-Mar-95	10:00	Kec. Lhoknga/ Leupung B. Aceb	05-34-00N	95-10-00	16	Passenger	Indonesia	Fire	Nil	Nil	
176	22-Mar-95	05:30	5	00-45-10S	104-12-40	101	Tug Boat	Indonesia	Sunken	Nil	Nil	
177	26-Mar-95	22:15		01-16-30S	116-48-01	4 / 5,552	Speed Boat /	Indonesia /	Collision	Nil	Nil	Capsized /
179	05-Apr 05	11.95	Pier of Pare Pare Dave	04-01-005	110-27.00	2 202	Cargo	Indonesia	Accident on	1	Nil	
170	18-Apr 05	06.21	Belawan Harbour Water-	03-40 00N	008 42 40	4,629 /	Tanker / Corre	Indonesia /	the deck	NU	NI	
1/9	10-Apr-95	00:31	Delawall Harbour waters	03-49-001	090-43-48	3,257	ranker / Cargo	Indonesia	Comsion	INII	1111	

No	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Shin	Flag	Kind of	Victims	Loading Loss	Remarks
100	00 4 07	00.15		00.17.000	100 57 00	415		T lug	Accident	NUL	(Ton)	Remarks
180	20-Apr-95	03:15	27 NM off east of Reo.	09-21-005	120-57-00	415 289	Passenger		Fire Stranding	Nil	410 Nil	
182	27-Apr-95	11.00		05-40-00	117-30-00	736*	Motor Ship	Indonesia	Sunken	Nil	total loss	
183	06-May-95	13.44	Outer Ambang Channel,	03-30-005	114-30-00	6 022 / 264	Passenger /	Indonesia /	Collision	Nil / Nil	Nil / Nil	
100	00 May 00	10.11	Barito River	00 00 005	111 00 00	0,0227201	Cargo	Indonesia	comsion	i i i i i i i i i i i i i i i i i i i		
184	08-May-95	01:00		05-06-00S	120-41-00	110	Barge	Indonesia	Stranding	Nil	20	
185	09-May-95	06:30		09-21-00S	121-12-00	380	Cargo	Indonesia	Flooding	Nil	Nil	
186	18-May-95	02:30	Pier of Tlk. Nibung	01-05-00S	100-20-00	96	Cargo	Indonesia	Fire	1	Nil	
187	19-May-95	21:31		05-55-02S	105-56-64	4564 / No	Passenger / No	Indonesia / No	Collision	3 injury/	18 Mobiles /	/ Hit and run
	_					23 299 / No	Cargo /	Indonesia /		No Data	No Data	
188	28-May-95	05:45		28-51-50N	120-31-57	Data	Fishing Boat	China	Collision	Nil / Nil	Nil / Nil	
189	04-Jun-95	05:30	Off Tanjung Putting	03-30-00S	111-32-00	161	Cargo	Indonesia	Fire	4	Nil	Sunken
100	05 Jun 05	02.20		01 15 20N	104 22 00	65,620/6	Tug Boat +	Singapore /	Collision	N31/9	N31 / N31	
190	05-Jun-95	03:30		01-15-30IN	104-22-00	00+039/0	Fishing Boat	Indonesia	Comsion	INII / 3		
101	00 1 05	00.00	Panjang Strait Channel	05 99 905	105 10 45	1	Creed Deat	Trademonta	Eine	NE	NH	
191	06-Jun-95	06:00	Waters	05-28-305	105-18-45	1	Speed Boat	Indonesia	Fire	INII	INII	
192	10-Jun-95	21:00	Air Hiter Cturit Device a	03-02-00S	121-12-00	254	Cargo	Indonesia	Fire	Nil	Nil	Sunken
193	11-Jun-95	03:00	Air Hitam Strait, Panjang	05-28-00S	105-18-30	7 / No Data	Cargo / No Data	Indonesia / No Data	Collision	I / N0 Data	Nil / No Data	Sunken / Hit
104	10 Jun 05	19.10	End of east side of Pier,	07 49 005	114 19 00	000/0	Passenger /	Indonesia /	Callinian	Nal / 9	N1:1 / N1:1	and run
194	12-Jun-95	13:10	Jangkar Port Waters	07-43-005	114-12-00	333 / Z	Fishing Boat	Indonesia	Collision	N11 / Z	N11 / N11	
195	17-Jun-95	12:53	Pier II of Celukan	08-11-00S	114-50-00	1,904	Cargo	Indonesia	Collision to	Nil	Nil	
			Bawang, Bali 25 NM South West of				0		Pier			
196	18-Jun-95	13:30	Rinca Is., Kec. Komodo	08-58-00S	119-15-00	173	Cargo	Indonesia	Sunken	17	360	
107	10 Jun 05	10.20	around	0.21.005	120 50 00	174	Cargo	Indonesia	Stranding	Nil	199	
197	19-Juli-95	19.30	Sarbete/Larantuka Is.,	0-21-003	129-39-00	174	Cargo	Indonesia	Stranding	INII	100	
198	20-Jun-95	02:35		01-09-45N	104-11-55	2,574	Passenger	Indonesia	Fire	Nil	Nil	
199	29-Juli-93	16.10	about 50 NM to West side	03-42-223	107-17-42	337	Cargo	muonesia	Sunken	INII	730	
200	29-Jun-95	03:00	of Take Rewatiya	06-05-00S	118-54-00	125	Cargo	Indonesia	Sunken	Nil	100	
201	01-Jul-95	05:00		01-55-00S	106-16-30	269 / 1.459	Tug Boat /	Honduras /	Touching to	Nil/1	Nil / Nil	
201	01 0 41 00	00.00	Tanjung Patu Takang	01 00 005	100 10 00	2007 1,100	Barge	Singapore	draft			
202	06-Jul-95	No Data	Waters	00-53-00N	123-43-00	297	Cargo	Indonesia	Stranding	Nil	646	Sunken
203	17-Jul-95	05:30	Waters	00-53-00S	105-41-00	128	Cargo	Indonesia	Sunken	Nil	180	
204	18-Jul-95	14.00	West side of Tg. Putting,	03-31-005	111-25-00	25	Fishing Boat	Indonesia	Sunken	Nil	Nil	
201	10 0 41 00	11.00	Central Kalimantan	00 01 005	111 20 00	20	T Ioning Dout	muonesiu	Buillen			
205	23-Jul-95	09:20	About 45 NM to east off Karimun Jawa	05-55-00S	111-48-00	119	Sailing Boat	Indonesia	Sunken	12	Nil	
206	24-Jul-95	04:00	Sanggar Strait Waters	04-51-03N	100-33-03	7	Passenger	Indonesia	Fallen to sea	1	Nil	Missing
207	26-Jul-95	23:30	Karawaringin	02-10-00N	117-42-00	69	Cargo	Indonesia	Sunken	Nil	40	
208	29-Jul-95	02:20	East side of Gersik Is.	03-00-00S	107-16-00	No Data /	No Data /	No Data /	Collision	No Data /	No Data / 560	Hit and Run /
			about 3NM b/w Tø			270	cargo	Indonesia		NII		Sunken
209	31-Jul-95	04:30	Semisir & Sekateng (Laut	03-31-40S	116-00-00	108	Cargo	Indonesia	Fire	Nil	120	Sunken
			Is.)				5					
210	04-Aug-95	03:00	Pier of Waingapu	09-38-20S	120-15-00	33	No Data	Indonesia	Fire	Nil	Nil	Ship not
			Ta Perak									registered
211	12-Aug-95	08:30	Pier of Pg. Terak.	07-12-43S	112-43-00	No Data	Speed Boat	Indonesia	Sunken	11	Nil	
	0		Surabaya									
212	13-Aug-95	07:45	about 5NM from	08-31-30S	115-36-00	13	Speed Boat	Indonesia	Capsized	14	Nil	
919	15 Aug 05	02.00	Padangbai, Bali	01 10 005	108 10 00	480	Cargo	Indonesia	Sunkon	Nil	300	
213	13-Aug-95	02:00		05-33-06S	104-13-05	3.926	Cargo	Indonesia	Sunken	Nil	6,300	
215	20-Aug-95	02:00	Makassar Strait	02-32-20S	118-12-40	37	Cargo	Indonesia	Sunken	Nil	12 *	
216	24-Aug-95	03:20	South-west of Batubara	07-02-00S	120-45-00	116	Cargo	Indonesia	Sunken	Nil	100	
217	27-Aug-95	09:30		00-12-50S	103-52-00	70 / 446	Tug Boat &	Indonesia	Stranding	Nil	Nil	
218	27-Aug-95	No Data		10-28-30S	122-40-30	6	Cargo	Indonesia	Sunken	Nil	30 *	
219	02-Sep-95	21:12		02-05-45S	105-05-75	49,342 *	Passenger	Indonesia	Stranding	Nil	Nil	
220	13-Sep-95	12:00	Sari Coast, Pekalongan	06-51-00S	109-42-00	15		Indonesia	Stranding	Nil	Nil	
221	17-Sep-95	02:00	D/W WOWONI IS. Waters	04-07-00S	123-06-00	169	Passenger	Indonesia	Stranding	Nil	Nil	
222	23-Sep-95	19:30	and shore of Suldwest IS.	01-06-08S	103-42-93	62	Cargo	Greek	Stranding	Nil	Nil	<u> </u>
222	22-Oct-95	18.20	Waters of port of	01-09-00N	103-53-00	172	Cargo	Indonesia	Fire	Nil	Nil	
~~0	~~ OCC=33	10.30	Belakang Is.	01 00-00IN	100-00-00	113	Cargo	maonesia	rne	1111	1111	
224	25-Oct-95	14:45	waters of about 100NM	03-00-00S	094-38-00	21	Fishing Boat	Indonesia	Fire	Nil	Nil	
007	00.0 : 05	04.07	Pier of of Plengsengan	07.11.100	110 11 07	070	P		G 1	N7-1	960	** 1 * **
225	26-Oct-95	04:35	Ujung, Surabaya	07-11-438	112-44-06	270	Passenger	Indonesia	Sunken	Nil	200	Under Loading
226	02-Nov-95	03:00	Waters of Halang	01-09-00N	103-53-00	5	Fishing Boat	Indonesia	Fallen to sea	1	Nil	
			Belakang Is. Waters h/w Jemur Is. &				5					
227	03-Nov-95	10:15	Pandan Is.	02-20-00N	101-35-00	1,592	Cargo	Indonesia	Fire	Nil	2,340	Sunken
220	01-Dec 05	14.45	Waters of Sugi Bawah Is.,	00-41 00N	103-44-00	20	Tug Boot	Panama	Supkon	Nil	Nil	
220	01-Dec-95	14.45	Kec. Moro	00-41-00IN	103-44-00	29	Tug Boat	r anama	Junken	INII	INII	
229	01-Dec-95	00:45		00-39-50N	103-41-30	877 / No Doto	Cargo / No	Indonesia / No	Collision	Nil / No Dete	Nil / No Data	/ Hit and run
230	04-Dec-95	19:30		06-08-535	108-25-91	910	Tanker	Singapore	Sunken	Nil	1,700	Crude Oil
231	06-Dec-95	18:00		02-52-00S	107-18-00	494	Cargo	Indonesia	Sunken	Nil	424	Cruce On
232	07-Dec-95	13:10		05-43-30S	103-13-00	143	Barge	Indonesia	Sunken	Nil	Nil	
233	07-Dec-95	07:10		03-46-03S	114-30-05	250	Tug Boat	Singapore	Flooding	Nil	Nil	
234	07-Dec-95	05:00	Waters of Lampui Bay,	09-03-00S	117-12-00	56 + 2,224	Tug Boat +	Panama +	Stranding	Nil	Nil	
235	08-Dec-95	23.15	Sumbawa Is.	06-27-065	113-47-06	726	Cargo	Indonesia	(Barge only)	7	Nil	Stranding
200	11 D 07	14.00	Bone Bay b/w Lasusua	05 00 000	190 49 00		Deserver	Indonesia	Cumler-	64	20	Scrunding
236	11-Dec-95	14:00	and Siwa	00-00-00S	120-43-00	34	Passenger	indonesia	Sunken	64	20	
237	11-Dec-95	15:00	Bone Bay around	03-08-00S	120-35-00	45	No Data	Indonesia	Sunken	Nil	6	
238	13-Dec-95	09:00	Is.	03-25-00S	108-00-00	57 + 307	Barge	Indonesia	Sunken	Nil	Nil	
·			101									

Source: DGSC Data and Maritime Court Decision Data

No.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss	Remarks
239	17-Dec-95			02-43-00S	122-41-00	488	Cargo	Indonesia	Sunken	Nil	750	
240	27-Dec-95	02:00	Waters of West Kalimantan	00-00-00	108-00-00	171	Cargo	Indonesia	Sunken	Nil	20	
241	29-Dec-95	02:00	Waters of Biawak Is., Indramayu	06-14-00S	108-18-00	No Data	Fishing Boat	Indonesia	Sunken	2	Nil	Hit and run by No Data shin
242	03-Jan-96	21:10	maranayu	03-48-30S	098-43-30	3,473 /	Cargo / Tanker	Indonesia /	Collision	Nil / Nil	Nil / Nil	110 Data Ship
242	04 Jap 96	00.15	Jawa Sea, about 20NM to	03 33 005	107 12 00	1,178	Cargo	Indonesia	Sunkon	0	279	
243	13-Jan-96	16:30	south from Simedang Is. Branch of Kateman	00-26-00N	107-12-00	No Data	Passenger	Indonesia	Sunken	3	Nil	
245	19-Jan-96	20:40		05-46-30N	095-22-25	190	Passenger	Indonesia	Sunken	338	78	
246	21-Jan-96	07:00	Waters of South of Tg. Putting	03-31-00S	111-47-00	47	No Data	Idonesia	Sunken	Nil	Nil	
247	10-Feb-96	20:54	Nusantara Pier, Baai Port, Bengkulu	03-47-00S	102-15-00	970	Cargo	Indonesia	Collision to Dolphin	Nil	Nil	
248	15-Feb-96	02:30	Pile acreage of Sapudi	08-36-00S	118-12-0	268	Piling Boat	Indonesia	Collision to	Nil	Nil	
249	17-Feb-96	01:00	Tanjung Torobeang,	07-22-00N	120-41-00	172	Cargo	Indonesia	Stranding	Nil	150	
			Flores Sea Coast of Pacat Bay, about				0		0			
250	02-Mar-96	07:00	10NM from Kendawangan Port	00-54-00N	103-24-00	5	Cargo	Indonesia	Sunken	1	Nil	
251	23-Nov-96	15:35	East side of Pier at Lembar Port	08-44-00S	116-04-00	849 / 4	Passenger ship / Boat	Indonesia / Indonesia	Collision	Nil / Nil	Nil / Nil	
			I ambala Ia						Collision to			
252	06-Dec-96	23:23	Enter Channel of Lembar	08-44-00s	116-03-20	676	Cargo	Indonesia	Beacon	2	Nil	
			Port						(Green), Lembar Port			
253	08-Dec-96	01:45	Seraya Besar Strait, Pasir Putih Village Kec	08-26-005	119-26-00	6	Cargo	Indonesia	Sunken	Nil	30	
200	00 200 00	01110	Komodo, Kab. Manggarai	00 20 000	110 20 00	Ű	cuigo	Ct. Vincent 9	Buillion			
254	08-Dec-96	01:45	No. 302 Quay, Tg. Priok	06-05-00S	106-53-00	9,513	Cargo	the	Fire	Nil	Nil	
							True Deate :	Grenadines	Engine			
255	11-Dec-96	06:10		04-31-32S	115-32-00	35 + 173	Barge	Indonesia	Trouble +	Nil +Nil	Nil + 495	
256	12-Dec-96	02:00		03-30-00N	107-10-00	171	Cargo	Indonesia	Sunken	13	283	
257	12-Dec-96	05:00		04-01-47S	118-54-56	620	Cargo	Indonesia	Stranding Flooding /	Nil	1,000	
258	24-Dec-96	03:00		05-08-13S	119-23-04	1,549	Cargo	Panama	Stranding /	Nil	Nil	
259	29-Dec-96	09:29	2NM to south from Sebesi	05-59-00S	105-53-00	34	Passenger	Indonesia	Sunken	Nil	Nil	
260	04-Jan-97	05:30	Pier of Tg. Pandan Port	02-36-00S	107-37-00	405	Cargo	Indonesia	Fire	Nil	238	
261	05-Jan-97 15-Jan-97	19:23		03-33-555	114-28-07	6,022	Passenger Passenger	Indonesia Indonesia	Stranding Diving to sea	Nil 1	Nil	
202	10 5411 07	10.10	Cargo Pier of Benoa Port	00 22 000	122 00 00	0,000	russenger	muonesia	Worker			
263	16-Jan-97	10:20	Bali	08-45-25S	112-12-56	1,487	Cargo	Indonesia	struck down by Container	1	Nil	
264	28-Jan-97	No Data	Eastern part of around Bawean Is.JAWA	05-49-05S	113-23-06	4,119	Cargo	Indonesia	Sunken	Nil	2,000	
265	29-Jan-97	01:10		05-13-03S	115-20-00	93 + 1,000	Tug Boat + Barge	Indonesia	- / Sunken	Nil + Nil	Nil + 1,287	
266	03-Feb-97	03:30	Larantuka Port	08-21-00S	122-59-00	121	Cargo	Indonesia	Fire	Nil	151	Sunken
267	15-Feb-97	01-27		05-26-30S	106-41-40	884 / 115	Cargo / Cargo	Indonesia / Indonesia	Collision	Nil / Nil	Nil / 501	/ Sunken
268	17-Feb-97	07:00		10-43-30S	106-41-40	96	Fishing Boat	Indonesia	Sunken	Nil	10	
269	17-Feb-97	19:23	Surabaya Port	07-11-42S	112-43-07	20,945	Cargo	Indonesia	Collision to Pillot Boat	Nil	Nil	
270	19-Feb-97	18:00	Merak Waters of south side of Merak Kecil Is	05-56-00S	106-00-00	5,543	Ocean Going	Indonesia	Fire	Nil	Nil	
271	19-Feb-97	10:30	Side of Merak Keeli 13.	00-55-40N	104-25-40	18	~	Indonesia	Sunken	1	2	~ 1
272	22-Feb-97	12:45	North of To Dujut	01-15-46	106 02 10	34 No Data /	Cargo Tug Boat /	Indonesia /	Capsized	I Nil / Nil	Nil Nil / 2 400 KI	Sunken
213	24-1.6D-91	16.40	Jawa Sea, about 30 NM	00-04-103	114.00.05	No Data	Barge	Singapore	- / Sunken		1 000	
274	05-Mar-97	02:30	to south from Masalembo	06-08-00S	114-20-00	643	Cargo	Indonesia	Sunken	21 N9	1,000 Nii	
276	30-Mar-97	21:00		05-20-00S	121-11-00	340	Cargo	Indonesia	Sunken	Nil	117 *	
277	01-Apr-97	23:30		00-00-13S	109-19-44	5,938	Cargo	Indonesia	Fire	Nil	Nil	
278	09-Apr-97	17:30		10-12-00S	123-31-30	634	Passenger	Indonesia	broken by	Nil	Nil	
279	15-Apr-97	22:30		08-24-30S	122-16-40	171	Cargo	Indonesia	Fallen to sea	1	Nil	Captain
280	20-Apr-97	03-30	Tg. Pinang, Jakunyir river	06-00-00S	105-56-00	16 / 17	Speed Boat / Speed Boat	Indonesia / Indonesia	Collision	1 / Nil	Nil / Nil	
281	24-Apr-97	09:30		00-53-00N	103-07-10	34	Cargo	Indonesia	Stranding	Nil	Nil	
282	28-May-97	03:45	South of Light Beacon.	03-26-00N	099-39-15	162	Cargo	Indonesia	Sunken	Nil	199	
283	30-May-97	z3:30	Dayangdayangan Besar Marawang Village Muda	05-24-00S	119-11-00	139	Tug Boat	Indonesia	Stranding	Nil	Nil	
284	02-Jun-97	20:00	Is., Kec. Kuala Kampar	05-34-00N	100-20-00	4	Speed Boat	Indonesia	Surker	19	Nil	Sunken
285	07-Jun-97	16:25		06-50-20S	105-54-10	177 + 2132	Barge	Singapore	Stranding	Nil + Nil	Nil + Nil	
286	10-Jun-97	23:00		04-07-15S	107-11-35	291	Cargo	Indonesia Indonesia	Sunken Stranding	Nil	420 Nil	
288	15-Jun-97	09.30	60 NM to south-west from	06-10-005	113-30-00	331	Cargo	Indonesia	Sunken	4	312	
289	17-Jun-97	06:15	Masalembo Is.	05-39-00S	116-09-06	49,727	Tanker	Indonesia	Missing.	1	Nil	
290	19-Jun-97	10:03		00-42-55N	108-40-10	1,314 /	Tanker / Cargo	Panama /	Collision	Nil / Nil	Nil / Nil	
291	21-Jun-97	04:30		03-47-30S	128-00-30	5,043 87	Cargo	Indonesia	Sunken	1	Nil	

No.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
292	25-Jun-97	09:00	Karang Genting, South- east of Siliu Is.	03-34-00S	107-41-00	303	Cargo	Indonesia	Sunken	Nil	Nil	
293	26-Jun-97	20:55	Jawa sea, near center b/w Sampit & Bawean	04-00-00S	112-55-00	494	Cargo	Indonesia	Sunken	Nil	450 *	
294	27-Jun-97	19:00		00-45-45N	104-22-15	35	Cargo	Indonesia	Sunken	Nil	35	
295	30-Jun-97	09:05		00-54-30S	108-52-00	1,019	Cargo	Indonesia	Sunken	Nil	1,265 *+3	
296	04-Jul-97	15:05	North side of Moyo Is., Sumbawa	08-15-00S	117-33-00	146	Cargo	Indonesia	Fire	Nil	200	Sunken
297	06-Jul-97	07:40		01-13-11S	116-59-00	395 / No Data / Unnown	Tug Boat / No Data / No Data	Indonesia / Indonesia / Indonesia	Collision	Nil / Nil / Nil	Nil / Nil / Nil	
298	12-Jul-97	14:00		00-58-39N	104-13-39	102	Passenger	Indonesia	Sunken	14	Nil	
299	14-Jul-97	00:35 No data	Tonak waters, Toba lake	05-10-00S	098-36-00	19	Passenger No Data	Indonesia Indonesia	Capsized	83 Nil	Nil	
201	17 Jul 07	21.00	50 NM to east of Bawean	05 42 005	111 50 00	100	Corre	Indonesia	Sunken	NI	Nil	
301	17-Jul-97	21.00	Is. Balikpapan Port	01 16 195	116 47 46	8 0 4 2	Tankar	Singanoro	Flooding	Nil	Nil	
302	17-Jul-97	03:00	Waters of South of Lombok Is.	09-10-00S	116-25-00	No Data	Fishing Boat	Indonesia	Sunken	2	Nil	
304	19-Jul-97	04:44	Pier of Peuyaberangan Port, Bakau heni	05-52-00S	105-45-00	5,584 / 58	Passenger / Passenger	Indonesia / Indonesia	Collision	Nil / Nil	Nil / Nil	/ Sunken
305	19-Jul-97	17:15		06-17-15S	112-43-25	54 + 638	Tug Boat +	Indonesia +	- / Sunken	Nil	Nil	
306	20-Jul-97	09:00		04-50-20S	119-32-22	2	Passenger	Indonesia	Sunken	9	Nil	
307	29-Jul-97	15:45		00-45-30N	127-18-40	1,242	Tanker	Singapore	Stranding and crush to	Nil	Nil	
308	01-Aug-97	17:00	Tg. Gundulan	05-44-00S	104-39-00	111	Cargo	Indonesia	Sunken	Nil	103 *	
309	06-Aug-97	13:00		01-00-50N	104-13-45	46	Passenger	Indonesia	Stranding	Nil	Nil	
310	08-Aug-97	21:35	Lombok Strait, about 10	05-52-47S	105-21-87	3,803	Cargo	Indonesia	Sunken	Nil	5,755 *	
311	09-Aug-97	03:00	NM to West from Lembar Port	08-41-00S	115-54-00	206	Cargo	Indonesia	Sunken	Nil	401 *	
312	14-Aug-97	07:00		06-35-30S	105-30-29	6	Fishing Boat	Indonesia	Sunken	9	Nil	
313	18-Aug-97	19:30		04-12-00S	115-46-08	Data	Fishing Boat	Data	Collision	Nil / Nil	Nil / Nil	
314	19-Aug-97	01:30	Outer, Cilacap	07-44-00S	109-00-00	6,133 / 269	Tanker / Tug Boat	Indonesia /	Collision	Nil / Nil	Nil / Nil	
315	21-Aug-97	08:04		00-53-15S	104-23-35	626	Cargo	Indonesia	Sunken	5	400	
316	27-Aug-97	No Data	Cirebon port channel waters	06-42-28S	108-34-32	2	Fishing Boat	Indonesia	Sunken	1	Nil	
317	27-Aug-97	01:30	Merak Port, Out Channel	05-56-00S	10600-00	2,773 / 5	Passenger / Cargo	Indonesia / Indonesia	Collision	Nil / Nil	Nil / 10	
318	01-Sep-97	12:45		00-52-31N	103-15-55	138	Barge	Indonesia	Sunken	Nil	Nil	
319	01-Sep-97	22:00		03-33-44S	127-17-00	118	KLM D	Indonesia	Drifting Collision to	Nil	Nil	
320	05-Sep-97	16:30	Pier of Unloading Stand of	01-07-50N	102-09-30	742	Barge	Indonesia	Buoy (Green) Collision to	Nil	Nil	
322	09-Sep-97	19:30	Pertamina, Kotabaru	04-55-40S	122-44-08	6 / No	Cargo / Motor	Indonesia /	Pier Collision	Nil / 1	Nil / Nil	/ Sunken
202	15 6 07	01.20	Bay b/w Tg. Tuing and	01 48 005	100 08 00	Data	Boat Tug Boat +	Indonesia Indonesia +	Charles dia at a	NEL NEL	NI2L NI2L	
323	15-Sep-97	01:30	Mouth of Mapur	01-48-005	106-08-00	81+1,271	Barge	Singapore	Stranding + -	N11 + N11	N11 + N11	
324	16-Sep-97	05:30		01-01-005	104-32-01	224	Tug Boat +	Singapore +	Sunken	INII NEL NEL	542 *	
323	10-Sep-97	20:00		03-10-255	110-00-07	2 010	Barge	Singapore	/ Stranding	INII + INII	NII + NII	
326	16-Sep-97 16-Sep-97	13:26	C Pier of Paniang Port	02-07-25S 01-44-00N	098-46-00	3,619	Cargo	Indonesia	Fire	Nil	5,328 * Nil	Sunken
328	16-Sep-97	20:07		00-05-22N	109-06-22	3,255	Cargo	Indonesia	Stranding	Nil	Nil	
329	16-Sep-97	01:00	No. IV Pier of To. Intan	00-36-18N	104-08-30	826	Cargo	Indonesia Singapore +	Sunken / Collision to	Nil	Nil	
330	19-Sep-97	07:00	Port, Cilacap	06-42-00S	108-59-30	190 + 2,374	Barge	Singapore	Pier	Nil + Nil	Nil + Nil	
331	21-Sep-97	12:48		00-48-39N	104-36-06	50 202 / No	Tug Boat	Indonesia	Sunken	Nil	Nil	
332	24-Sep-97	11:55		01-10-58N	103-24-55	Data	Data	Israel	Collision	Nil / Nil	Nil / Nil	
333	24-Sep-97	08:35		05-23-53N	111-29-12	99 / 291	Tug Boat + Barge	Indonesia + Indonesia	- + Sunken	Nil	Nil	
334	01-Oct-97	01:30	Tegal Port	06-51-00S	109-08-00	209	Cargo	Indonesia	Fire	Nil	Nil	
335	01-Oct-97	07:29	Navigational Channel, Salah Nama Is., Musi Biyar	03-20-00N	099-43-00	3,348 / No Data	Cargo / No Data	Belize / No Data	Collision	Nil / 9	Nil / Nil	
336	02-Oct-97	16:45	141761	04-40-00S	112-50-00	182	Tug Boat	Indonesia	Fallen to sea	1	Nil	
337	03-Oct-97	05:00	DKI Dian of Deleterer	11-15-00S	116-58-00	34	Fishing Boat	Indonesia	Fire Faller to a	Nil	Nil	<u>_</u>
220	12 Oct 07	02:00	r Ki Fier of Pekalongan	07 44 155	115 20 10	92	Corg-	Indonesia	Engine	I NEI	INII NI:I	
339	21-Oct-97	05:15		07-44-155	104-57-01	489	Cargo / Tanker	Indonesia /	Trouble	Nil	Nil	
241	22 Oct 07	01.00		01 07 50N	102 00 33	5,464 / 39 +	Cargo / Tug	Indonesia Panama / Indonesia	Collision	Nil / Nil	Nil / Nil - Nil	
341	02-Nov-97	01:30		01-02-365	102-09-33	516 14,501	Boat + Barge Passenger	Indonesia + Indonesia Indonesia	Stranding	+Nil Nil	Nil	
343	20-Nov-97	14.04		10-37-115	117-17-54	6,022 /	Passenger /	Indonesia /	Collision	Nil	Nil	
344	05-Jan-98	No data	No data	No data	No data	3,936 No Data	Cargo Fishing Boat	Indonesia Srilangka	Drifting from	Nil	Nil	
345	14-Jan-98	16:46	No data	08-44-30	116-03-15	3.746 / 291	Cargo / Cargo	Indonesia /	Sri to Indon. Collision	No Data /	No Data / No	L
346	22-Jan-98	No data	Waters of Tg. Aru., Kab.	04-25-00N	098-17-00	36	Cargo	Indonesia Indonesia	Sunken	No Data 14	Data Nil	
347	25-Jan-98	No data	Pasir Panjang Strait	01-43-03N	098-46-06	No Data	Passenger	Indonesia	Sunken	56	Nil	
348	03-Feb-98	12:00	Cilacap Ningh Device a	06-42-00S	108-59-30	69	Fishing Boat	Indonesia No Data	Fire	2	Nil	
549	11-rep-98	10:30	Tyipan, Panjang	04-13-00IN	100-32-00	INU Data	INU Data	INO Data	Suiken	20	INII	1

No.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
350	17-Feb-98	10:00	most outer part of enter channel, Samarinda	00-55-00S	117-15-00	No Data	No Data	No Data	Sunken	Nil	Nil	
351	26-Feb-98	04:00	Mansib river, Kec. Rimba Melintang, Bengkalis	01-22-00N	102-10-48	No Data	No Data	No Data	Sunken	Nil	Nil	
352	02-Mar-98	23:00	Kolam Zona, Benoa Port area	08-45-00S	115-13-00	28	Sishing Boat	Indonesia	Fire	Nil	Nil	
353	06-Mar-98	22:45	No data	No data	No data	31	Motor Ship	Indonesia	Fire	Nil	Nil	
354	08-Mar-98	23:30	No data	No data	No data	929	No Data	No Data	Collision to Pier	Nil	Nil	
355	10-Mar-98	08:26	Pier of Luwuk Port	00-57-00S	122-48-00	929	Cargo	Indonesia	Collision to Pier	Nil	Nil	
356	12-Mar-98	04:00	Jawa Sea, Jepara	06-30-00S	110-40-00	94	Cargo	Indonesia Rolizo	Fire	Nil	Nil	
358	20-Mar-98	00:15	No data	No data	No data	1,223	No Data	Indonesia	Declivity	Nil	Nil	
359	29-Mar-98	07:00		01-20-23N	102-10-00	23	No Data	Indonesia	Sunken	Nil	Nil	
360	05-Apr-98	03:45		01-02-30N	102-04-30	115 / 6	Cargo / Motor Boat	Indonesia / Indonesia	Collision	Nil / Nil	Nil / Nil	
361	09-Apr-98	02:00	Waters of Serapah Tanah Glogat	02-21-05N/S?	116-37-00	74	LST	Indonesia	Sunken	Nil	Nil	
362	12-Apr-98	03:37	Kapuas Kecil River	00-00-09N	109-16-30	3,258 / 3,260	Cargo / Cargo	Indonesia / Indonesia	Collision	Nil	Nil	
363	12-Apr-98	03:37	a 1.a . 1	00-01-08N	109-16-06	3,260	Container	Indonesia	<i>a</i> . No. 1	Nil	Nil	
364	13-Apr-98	No data	Sapudi Strait, about	08-36-00S	118-12-00	6 / No Data	Fishing Boat /	Indonesia /	Collision to	Nil / Nil	Nil / Nil	
365	19-Apr-98	05:00	200m from Sukoranie port	04-31-505	120-27-50	692	Passenger	Indonesia	Stranding	Nil	Nil	
366	20-Apr-98	No data	Sapudi Strait	08-36-00S	118-12-00	No Data	Fishing Boat	Indonesia	Collision	Nil / Nil	Nil / Nil	
367	27-Apr-98	No data		06-41-53S	108-25-00	1,182	Cargo	Indonesia	Sunken	Nil	Nil	
368	09-Jun-98	05:00	Near Pu. Rakit South part of Jawa Sea	05-56-00S	108-23-00	592	Passenger	Indonesia	Sunken	Nil	Nil	
369	18-Jun-98	20:30	Pier of Pemda Pks	01-28-10S	102-06-19	76	Cargo	Indonesia	Sunken	Nil	64	
370	20-Jun-98	15:30	Anggit Strait	01-58-53N	102-33-17	75	Cargo KI M	Indonesia	Sunken	Nil	Nil	l
3/1	00 101 00	00:00	25MLS Seblah Barat	04-32-405	11/ 2/ 00	22 244	LCT	Indonesia	Fire	INII NGI	502	
372	09-Jul-98	00.25	from Tg.Selatan	04-21-303	114-24-00	244	Motor Ship /	Indonesia /	Suikeii	8 / No	392 NU (N. D. )	
373	16-Jul-98	02:30		02-56-028	104-57-41	5 / No Data	Unknwon	Indonesia	Collision	Data	Nil / No Data	
374	17-Jul-98	23:55		05-52-10S	105-46-30	4,872	Passenger	Indonesia	Stranding	Nil	Nil	l
375	26-Jul-98	10:00	No data	03-33-25N	104-57-58	225	No Data	No Data	Sunken	Nil	Nil	
376	30-Jul-98	23:00	No data	No data 04-14-06S	No data 106-14-50	29	Cargo	Indonesia	Sunken	Nil Nil	12 + 36 Cows 293	Timber
070	12-Aug-30	01.00		04-14-005	100-14-30	N D	Passenger /	Indonesia /	Guinen	111	200	Timber
378	17-Aug-98	04:55		02-23-00N	101-40-410	No Data	Bulk Carrier	Panama	Collision	4	Nil	
379	19-Aug-98	16:00		03-35-05S	113-07-00	35	No Data	Indonesia	Flooding	Nil	Nil	
380	22-Aug-98	11:15	Pesisir Wilvoto Kawa	06-03-00S	106-53-30	1,165	Cargo	Indonesia	Sunken	Nil	232	
381	05-Sep-98	22:00	Village, Kec. Piru Seram Barat, Kab. Maluku Tengah	02-55-28S	128-07-57	173	Cargo	Indonesia	Fire	Nil	1,000	
382	25-Sep-98	8:00		05-48-07S	105-35-02	387	Cargo	Indonesia	Stranding	Nil	Nil	
383	10 Oct 98	07:30		01-20-00N 01-24-20N	102-11-00	98 No Data	No Data	Singapore	Sunken	Nil Nil	Nil Nil	ł
385	24-Oct-98	No data		03-55-005	122-50-00	262	Cargo	No Data	Stranding	Nil	Nil	
386	09-Nov-98	04:00		01-04-20N	103-46-04	183	No Data	Honduras	Stranding	Nil	Nil	
387	10-Nov-98	10:00		00-48-00N	104-29-00	4,873	No Data	Indonesia	Sunken	Nil	Nil	
388	11-Nov-98	05.90		03-25-00N	100-03-00	4756	Cargo	Indonesia	Combon	9 N#1	NH	
389	11-IN0V-98	05:20	Teluk Bone Sulawesi	06-55-075	112-43-48	1/4	Penveberanga	Indonesia	Sunken	INII	INII	
390	13-Nov-98	23:00	Tenggara	04-20-15S	121-08-12	413	n Kanal	Indonesia	Sunken	8	15 cars	
391	15-Nov-98	05:40	Makassar Strait	01-25-45S	119-06-45	194	Pendarat	Indonesia	Sunken	Nil	Nil	
392	16-Nov-98	No data	No data	No data	No data	No Data	No Data	Indonesia	Trouble	Nil	Nil	
393	25-Nov-98	00.12		05-52-02S	108-45-05	5 837	Ferry	Indonesia	Stranding	Nil	Nil	
395	09-Dec-98	02:00		02-52-42S	104-08-45	456	Cargo	Indonesia	Sunken	Nil	400	
396	11-Dec-98	20:00		05-37-00S	108-47-00	269	LCT	Indonesia	Lasing Putus	Nil	Nil	
397	16-Dec-98	03:00	No data	No data	No data	45 / No Data	River Boat / No Data	Indonesia / No Data	Collision	2	Nil	
398	27-Dec-98	19:30	Sungai Jelai Kalimantan	No data	No data	Dutu	Cargo	Indonesia	Collision to Cable of PLN at Channel	Nil	Nil	
399	29-Dec-98	19:07		02-32-00S	107-37-00	134	Cargo	Indonesia	Sunken	Nil	Nil	
400	02-Jan-99	07:05	No data	No data	No data	50	Cargo	Indonesia	Sunken	Nil	Nil	
401	04-Jan-99	No data 20:00	No data	No data	No data	No data No data	No data	No data	Collision	Nil 1	Nil	
402	12-Jan-99	00.30		02-02-105	103-51-25	228	No data	Indonesia	Sunken	Nil	Nil	
404	14 Jax 00	16.45	Na data	No dat-	No dot-	9740	Cong-	Indone-!-	Collision to	NU	NII	[
404	14-Jan-99	10:45	Approach Channel to		INO data	3,740	Cargo	Indonesia	pier Collision to	INII	INII	
405	20-Jan-99	11:10	Pertamina Atapupu Port Waters of Tg. Kopondai	09-00-00S	124-52-00	1,536	l anker	Indonesia	Light Beacon	Nil	Nil	
406	20-Jan-99	07:15	Flores	08-06-00S	120-56-00	171	Cargo	Indonesia	Stranding	Nil	Nil	ļ
407	02-Feb-99	04:00		04-32-00S	120-28-00	1,080	Ferry	Indonesia	Stranding	Nil	Nil	ł
408	00-Feb-99	∠3:00	Laut Jawa	00-37-20IN 04-35-559	107-49-59	148	Cargo	Indonesia	Sunken	308	INII	}
410	07-Feb-99	07:30	Laut Jawa	00-20-06N	107-49-06	3.600	Cargo	San Lorenzo	Fire	Nil	Nil	
411	14-Feb-00	12.25	No data	No data	No data	3 070	Passenger	Indonesia	Passenger	1	Nil	ĺ
411	14-1.60-99	16.33	ino uata	i vo udla	ino udta	3,079	i assenger	muonesia	fallen to sea	1	1111	
412	17-Feb-99	03:10	Jawa Sea	04-35-55S	106-45-55	498	Cargo	Indonesia	Sunken	Nil	Nil	ł
413	10-Mar-99	14·15	Pelabuhan Pontianak	No data	No data	1.546	Passenger	Indonesia	No data	Nil	Nil	
415	14-Mar-99	09:30	9:30	01-51-10S	113-58-04	3	Boat	Indonesia	Sunken	Nil	Nil	
416	24-Mar-00	No data		00-28-455	102-56-40	285	Cargo	Indonesia	Stranding	Nil	Nil	
110	~ . mai-33	udta		00 80 100	102 00-10	200	Jungo	maoricola	and sunken	1111		ł

Source: DGSC Data and Maritime Court Decision Data

No.	Date	Time	Location	Latitude	Longuitude	Gross Ton	Kind of Ship	Flag	Kind of Accident	Victims	Loading Loss (Ton)	Remarks
417	27-Mar-99	21:30		05-33-06S	105-16-28	15,836	Motor ship	India	Stranding	Nil	Nil	
418	16-Apr-99	13:15		04-56-22S	142-48-00	715	Motor Ship	Indonesia	Stranding	Nil	Nil	
419	17-Apr-99	00:00		01-15-00S	104-43-00	34	Motor Ship	Indonesia	Sunken	2	Nil	
420	28-Apr-99	10:10		02 52 005	115-33-30	No Data	Motor Ship	Indonesia No Doto	Fallen to sea	1	IN11 Ni1	
422	18-May-99	19.10		08-27-595	119-19-05	672	No Data	Indonesia	Stranding	Nil	Nil	
400	99 Mar 00	09.90		02 01 005	100 10 45	2 109 / 957	No Doto	Singapore /	Callisian	1	NH	
423	23-May-99	02:30		03-01-005	106-16-45	3,198/257	No Data	Indonesia	Collision	1	Nii	
424	26-May-99	No data	No data	No data	No data	No Data	No Data	Indonesia	Collision	6	Nil	
425	31-May-99	22:00	North of TC Dutch	07-23-00S	106-16-45	225	LCT	Indonesia	Capsized	2	Nil	
420	11-Jun-99	18:30	North of TG. Priok	1N0 data	112 15 05	1,209	Supply boat	Indonesia	Sunkon	INII Nil	150	
428	03-Jul-99	04:00		03-52-005	112-30-00	281	KLM	Indonesia	Sunken	4	635 *	
400	00 1 1 00	00.00		00 50 000	111.01.04	000	P .	T 1 .	Flooding and	N.11	001	1
429	03-Jui-99	23:00		02-58-005	111-21-04	329	Багде	Indonesia	Sunken	INII	381	
430	17-Jul-99	05:00		03-52-05S	113-52-05	No Data	No Data	No Data	Sunken	Nil	Nil	
491	20 1-1 00	10.00	Karang Takabelakeng	02.95 595	110 54 45	179	Courte	Tudoucete	Charles allowed	N1:1	N141	
431	20-341-33	19.00	Tenggara	03-23-383	112-54-45	172	Cargo	indonesia	Stranuing	INII	INII	1
									Scratch of			
432	03-Aug-99	03:00		03-04-30S	112-40-32	336	Tug Boat	Indonesia	Cable, Jawa	Nil	Nil	1
									Madura			1
433	06-Aug-99	01:00	No data	No data	No data	No Data	No Data	No Data	Stranding	Nil	Nil	
434	06-Aug-99	16:00		03-33-54S	124-28-50	1,505	Passenger	Indonesia	Stranding	Nil	Nil	
435	07-Aug-99	18:40		00-38-20N	101-36-45	1,377 / 75	Tanker / Tug	Indonesia /	Collision	10 / Nil	Nil / Nil	l
136	08-4110-00	01.00		03-51-005	110-44-00	19/	KI M	Indonesia	Sunkon	Nil	Nil	ł
437	10-Aug-99	17-02	ļ	04-09-25S	112-57-02	936	Cargo	Indonesia	Stranding	Nil	Nil	1
438	09-Sep-99	17:00		03-09-01S	113-03-01	128	KLM	Indonesia	Sunken	Nil	215	<u> </u>
439	09-Sep-99	19:30	Bali Pantai Sanur	08-42-00S	115-16-50	1,286	Tanker	Singapore	Stranding	Nil	Nil	
440	09-Sep-99	10:00	Di Gosong Buaya	No data	No data	150	KM	Indonesia	Stranding	Nil	Nil	l
1/1	20-Ser 00	03.00	Kalimantan Tengah	03-26-949	114-97 49	3 696	Passandar	Indonesia	Stranding	Nil	Nil	<u> </u>
449	21 Sap 00	04.00	Di Perairan Uj. Utara	No. doto	No doto	145	VIM	Indonesia	Stranding	NI	Nil	
442	21-Sep-99	04:00	Pu.Pelagan Selat Alas	INO data	INO data	145	KLM	Indonesia	Stranding	INII	INII	
443	19-Oct-99	06:51		01-10-09N	103-49-05	62,031 / 85 695	Tanker / Bulk Carrier	Liberia / Panama	Collision	Nil	Nil	l
444	19-Oct-99	01:00		03-02-04S	113-04-03	32	KLM	Indonesia	Sunken	Nil	80	
445	20-Oct-99	06:00		08-45-00S	111-01-00	443	Cargo	Philipines	Sunken	1	Nil	
446	20-Oct-99	No data	No data	No data	No data	130	KM	Indonesia	Sunken	4	Nil	
447	30-Oct-99	22:15	N. L.	05-52-28S	105-46-04	6,186	KMP	Indonesia	Stranding	Nil	Nil	
448	04-Nov-99	00:45	INO data	N0 data	114 27 04	480 No Data	Cargo	Indonesia	Stranding	Nil Nil	IN11 Nil	
449	13-Nov-99	No data		01-10-32S	121-20-21	26	KM	Indonesia	Sunken	Nil	Fuel Oil 25	1
451	12-Dec-99	04:32		01-21-45N	102-09-30	3,256	Cargo	Indonesia	Flooding	Nil	Nil	
452	28-Dec-99	22:00		08-28-29S	122-08-05	45	Cargo	Indonesia	Sunken	Nil	95	
453	18-Jan-00	04:30		06-47-00S	105-11-00	355	LCT	Indonesia	Sunken	1	260	
454	21-Jan-00	16:45		00-52-45S	121-35-12	5,801	Cargo	Indonesia	Collision to Pier	Nil	Nil	l
455	23-Jan-00	02:00		03-48-04S	122-31-20	15	KM	Indonesia	Sunken	7	Nil	
456	29-Jan-00	11:30		05-30-00S	104-37-05	314	Tug Boat	Indonesia	Propeller	Nil	Nil	
457	01 Eab 00	15.00		05 50 005	105 94 04	149	Banga	Indonesia	trouble	NB	NH	
457	01-Feb-00	15:00		02-29-092	105-24-04	148	Багде	Indonesia	Fire Callisism to	INII	INII	
458	03-Feb-00	00:30		03-11-14S	116-11-58	60	Barge	Singapore	dersus Pertamina yang baru	Nil	500	
459	03-Feb-00	00:30		00-37-20N	107-49-59	216 + 2 136	Tug Boat +	Indonesia +	Fire	Nil	Nil	
400		04.00			114 17 55	1 1 01	Barge	Singapore				l
460	04-Feb-00	04:30	Solat Bali	04-53-005	114-47-50	1,101	Cargo	Indonesia	Sunken Kapal Lalat	Nil Nil	940 NGI	
462	24-Feb-00	08:00	No data	No data	No data	5,393	Cargo	Indonesia	Fire	Nil	Nil	
463	04-Mar-00	13:00		08-38-00S	120-30-31	174	Cargo	Indonesia	Flooding	Nil	Nil	
464	03-Apr-00	07:00	No data	No data	No data	75	KLM	Indonesia	Sunken	Nil	18	
465	18-May-00	03:00		00-43-40N	118-06-40	34	KM	Indonesia	Sunken	Nil	Nil	
466	30-May-00	09:00	No data	No data	No data	230	Cargo	Indonesia	Sunken	14 N4	420	
407	10-Jun-00	11.55		00-33-4110	123-15-02	19	KM	Indonesia	Stranding	Nil	Nil	
469	17-Jun-00	17:00		04-15-005	106-22-30	359	KM	Indonesia	Sunken	Nil	379	
470	27-Jun-00	No data		05-17-03S	106-45-10	370	Barge	Indonesia	Sunken	Nil	Nil	1
471	29-Jun-00	08:40		02-34-04N	126-10-00	426	KM	Indonesia	Sunken	522	35	
472	09-Jul-00	11:00		00-31-04S	102-48-16	101	Tug Boat	Indonesia	Sunken	Nil	Nil	
473	17-Jul-00	No data		05-40-02S	102-51-06	789	KM	Indonesia	Sunken	Nil	Nil	
474	20-Jul-00 24-Jul-00	10:45		03-06-06S	103-46-03	2,718	Passenger Bulk Carrier	Turkey	Unknown	Nil	Nil	
476	25-Jul-00	08:12		07-46-09S	109-10-05	718	Tanker	Indonesia	Flooding	Nil	990	Aspal
477	19-Sep-00	02:00		12-16-45S	106-18-16	1,171	Cargo	Indonesia	Sunken	Nil	1,446	
478	20-Sep-00	05:55		01-29-27S	104-40-35	770	KM	Indonesia	Collision	Nil	Nil	
479	01-Nov-00	02:45		00-47-00S	104-26-15	21,162	Cargo	Dutch	Stranding	4	400	l
480	01-Dec-00	01:30		05-16-10N	107-07-35	444	KM	Indonesia	Sunken	Nil	496	
401	06-Feh-01	24:00:00		04-05-405	121-09-00	14,049			Stranding		<u>├</u> ───┤	
483	10-Feb-01	21:00		06-38-14S	112-54-07	164			Sunken			<u> </u>
484	14-Feb-01			11-43-00	118-56-00	22						
485	14-Feb-01	1:30		11-43-00S	118-56-00	196			Sunken		└─────────────────────────────────────	
486	24-Feb-01	16:00		06-09-11S	115-17-00	70			fire			
488	24-Mar-01	17:30		00-55-10N	104-23-35	51			Fire		<u>├</u> ───┤	
489	29-Apr-01	5:30		05-51-09S	105-08-08	5,507		1	Stranding		l {	[
490	18-May-01	8:30		04-03-03S	112-04-03	234			Sunken			

#### Appendix 2.10.1.

#### Summary of Indonesian Satellite Services Providers

## 1 Introduction

Since 1976 Indonesia has operated a national GEO telecommunications network based on U.S.-made Hughes, spin-stabilized spacecraft. Today the Palapa constellation consists of three HS-376 class spacecraft located at 108 degrees E (Palapa B2R, launched 13 April 1990), 113 degrees E (Palapa B2P, launched 29 March, 1987), and 118 degrees E (Palapa B4, launched 14 May 1992). These second generation Palapa spacecraft have an on-station mass of 630 kg and have all been launched by Delta boosters. (Palapa B2R was originally launched as Palapa B2 by the U.S. Space Shuttle in February 1984, but its perigee motor malfunctioned, leading to a Shuttle retrieval in November 1984. The spacecraft was then refurbished and relaunched as Palapa B2R.).

The Palapa B series of satellites carry 30-6GHz 1-4GHz transponders (including six spares) to support telecommunications services throughout Southeast Asia. The design lifetime of the spacecraft is eight years.

In 1991 the aging Palapa B1 satellite (June, 1983) was sold to Pasifik Satelit Nusantara (PSN) for a new mission to provide commercial services to the Pacific Rim region. Palapa B1 was moved to its new location near 134 degrees E during March-May 1992 and remained operational through 1994 despite its inclination of 4 degrees. During 1993 PSN and Tonga clashed over the use of the 134 degree E slot before an acceptable solution was reached.

The Palapa C series will employ Hughes' HS-601 spacecraft with 34 active transponders: 24 (with six spares) C-band, 6 (with two spares) extended C-band, and 4 (with two spares) Kuband. The on-station mass of the satellite at beginning of life will be 1,775 kg with a design lifetime of at least 12 years. Palapa C1 was followed in 1997-1998 by Palapa C2 which is designated to replace Palapa B2R.

On the horizon are two new GEO commercial communications networks with inaugural flights in 1996 and 1998, respectively. The Indostar system will provide direct broadcast television and radio services specifically for Indonesia. A Jakarta consortium, PT Media Citra Indostar plans to launch up to four American-built (International Technologies, Inc.'s Star spacecraft) satellites for positions at 105.9 degrees E, 106.1 degrees E, 114.9 degrees E, and 115.1 degrees E. The spacecraft will have an on-station mass of only 430 kg at the beginning of life with a design lifetime of at least seven years. The payload will consist of three S-band transmitters for television broadcasts and two L-band transmitters for radio services. One of these planned satellites has been launched as Cakrawarta-1 in 107.7 degree E and become the first broadcasting satellite in Indonesia that able to channel up to 60 equivalent digital MPEG2 standard canals. Trying to satisfy the growing demand for hand-held telephone service in Asia, PSN along with partners in Thailand and the Philippines has been deployed the field of Asia Cellular Satellite System (ACES), starting in 1998. The Garuda-1 spacecraft was built by Lockheed-Martin based on the A2100 satellite bus and has feature two 12 m umbrella antennas for L-band communications.

Different from the previous generation satellite, Telkom-1 Satellite is based on A2100A type in cube form possessing 3 (three) stabilizing axis or threeaxis stabilized. Telkom-1 Satellite is more stable compared to Palapa B2R and B-4 satellites with spin stabilized type. Total weight of Tekom-1 satellite at the time of launching is 2,784 kgs. With efficient capacity usage ability, Telkom-1 which originally is designed for 15 years operation, in the presence of fuel in single-launch scheme, its technical age can be extended up to 20 years. This technical age is twice as much compared to that of Palapa-B which is designed to operate up to 8 years. Total capacity of Telkom-1 Satellite of 5,663 Watts is allocated from the sun panel made of hi-efficiency silicon and gallium arsenide.

Payload capacity of Telkom-1 is 36 transponders, covering 24 C Band Standard and 12 C Band Extended, which means greater than Palapa B2R and B4 Satellites which is only 24 transponders of C Band standard. Capacity and level of reliability of Telkom-1 Satellite are also higher than its predecessors. With higher capacity, the users will obtain better signal quality and probable for antenna with smaller size, so that it is expected the price of its terminal can be more economical.

# 2 Indonesian Satellite's Owner and its Services

## 2.1 Summary

N o	Name of Owner	Satellite Name	Orbital	Expected end	Band	Capacity	Services
			Position	of life			
1	TELKOM, PT.	Palapa B2R	108E	2001	C-band	24 trps.	TRANSPONDER
		Palapa B4	118E	2004	C-band	24 trps.	LEASING
		Telkom-1	108E	2015	C-band	24 trps.	TV UPLINK
					Ext.C-	12 trps.	TELEPROGRAM
					band		INDONET
							VSAT
2	SATELINDO, PT.	Palapa C1	150.5E	2010	C-band	24 trps.	TRANSPONDER
		Palapa C2	113E	2010	C-band	24 trps.	LEASING
					Ext.C-	6 trps.	UPLINK &
					band		TURNAROUND
					Ku-band	4 trps.	VSAT
							INTERNET ACCESS
3	MEDIA CITRA	Cakrawarta-1	107.7E	2010	S-band	Eqv. 60	DIRECT
	INDOSTAR, PT				L-band	chs.	BROADCASTING
						MPEG2	SERVICE (DBS)
							VSAT
4	PASIFIK	Ex. Palapa B1	134E	1994 (out of	C-band	24 trps.	VSAT
	SATELIT			service)			
	NUSANTARA,	Garuda-1	123E	2012	C-band	24 trps.	GMPCS
	PT.	(M2A)					VSAT
							MULTI MEDIA
							APPLICATION (M2A)

# 2.2 Telkom's Satellite Services

Satellite Name	Palapa B2R	Palapa B4	Telkom - 1
Current/Expected Orbital Location	108°E	118°E	108°E
Stabilization	Spin-Axis	Spin-Axis	Three-Axis
Expected end of life/life time payload	2001	2004	15 years
Number of transponder	24	24	36
Polarization	Orthogonal Linear	Orthogonal Linear	Orthogonal Linear
Characteristic at Boresight:			
- G/T (dB/°K) on PAD 0 dB	0	0	0
- SFD (dBW/m²)	-95	-95	-98
- EIRP (dBW)	36	36	39 for Std C band
			41 for Ext C band
Manufacture	Hughes Aircraft Co.	Hughes Aircraft Co.	Locheed Martin
Туре	HS 376	HS 376	A21000A
Frequency Plan			
- Standard C Band Uplink	5926 - 6425 Mhz	5926 - 6425 Mhz	5926 - 6425 Mhz
Downlink	3700 - 4200 Mhz	3700 - 4200 Mhz	3700 - 4200 Mhz
- Extended C Band Uplink	-	-	6445 - 6705 Mhz
Downlink	-	-	3400 - 3660 Mhz

## 2.2.1 Satellite Technical Specifications

#### 2.2.2 Services

2.2.2.1 Transponder Leasing Service

Network Division PT. Telekomunikasi Indonesia (DIVNET) provides full or partial transponder capacity for analogue and digital carriage on Palapa B2R (will be replaced by Telkom-1) and Palapa B4 for short term basis (monthly basis) and long term basis (yearly basis).

Network Division PT. Telekomunikasi Indonesia (DIVNET) offers an occasional use of transponder to transfer and exchange content as a full end to end service among the user in ASEAN coverage (include Taiwan, Hongkong, PNG, North Australia).

Network Division PT. Telekomunikasi Indonesia (DIVNET) provides full TT&C service for primary or backup operation and launch support service to control satellite in transfer orbit before entering geo-synchronous orbit.

#### 2.2.2.2 VSAT Service

1. General Configuration

The general configuration of VSAT terminal consists of:

#### Antenna

The antenna used is of 2.4 m diameter for a speed up to 128 Kbps and 3.8 m of speed above 128 Kbps to 512 Kbps.

Outdoor Unit In form of RF terminal with power of SSPA 5 watts or 20 watts Indoor Unit In form of modem connected to the subscriber's terminal.

2. Application of VSAT Usage

In general, VSAT utilization is as inter terminal data communication/transfer, for instance, on-line banking, connection of Backbone - internet, voice over IP with its implementation, among others in form of:

PABX Telephone/Fax Connection to PSTN PC to PC Inter main-frame connection Inter LAN connection (WAN) Video Conference Computer host to DTE

3. General Requirements

To subscribe (lease) VSAT, DIVNET offered from the speed of 64 Kbps to 2,048 Mbps by preparing the terminal from antenna to modem, while the route/multiplexer equipment is provided by subscriber according to the requirement/usage.

4. Technical Requirement to User

In order to maintain the performance (reliability) of VSAT link from any external (environment) interruption, the following room condition and ration are required:

air-conditioned room with temperature of 22 C degrees and free from dust

power ration of 220V AC furnished with UPS of 1 KVA antenna placement ground (4x4m)

distance between the antenna to the customer terminal is not greater than 100 m.

2.2.3 Tariff of Services

## 2.2.3.1 Transponder Leasing Tariff

	1. Ottasioliai	· · · · · · · · · · · · · · · · · · ·			
No	Time/Month Accumulation (hours)	Prime Time (19.01 - 24.00) (US\$/Minutes)	Prime Time (05.01 - 19.00) (US\$/Minutes)	Non Prime Time (05.01 - 19.00) (US\$/Minutes)	Night Time (00.01 - 05.00) (US\$/Minutes)
1	500 - 700	14.00	14.00	12.00	8.00
2	250 - 500	17.00	17.00	15.00	10.00
3	0 - 250	18.00	18.00	17.00	12.00

#### 1. Occasional

## 2. Short-term

No	Time	Price (US\$)	Presentase (%)
1	1 year	1.700.000	100
2	11 month	1.615.000	95
3	10 month	1.516.000	89
4	9 month	1.419.000	83
5	8 month	1.306.000	77
6	7 month	1.172.000	69
7	6 month	1.040.000	61
8	5 month	884.000	52
9	4 month	732.000	43
10	3 month	573.000	34
11	2 month	380.000	22
12	1 month	190.000	11

# 3. Long-term

No	Transponder Divison	Band Width (KHz)	Obo Satelit (dB)	Tariff Per year (US\$)
1	1	36.000	0	1.700.000
2	3/4	24.000	-4,5	1.411.000
3	1/2	17.143	-7,5	1.025.000
4	1/4	8.372	-10,5	565.000
5	1/8	4.138	-13,5	379.000
6	1/16	2.057	-16,5	189.000
7	1/32	1.026	-19,5	103.000
8	1/64	512	-22,5	69.000
9	1/128	256	-25,5	34.000
10	1/256	128	-28,5	17.250
11	1/512	64	-31,5	10.250
12	1/1024	32	-34,5	5.175

**Transponder Technical Parameter** 

 $\begin{array}{l} G/T=0\ dB/K\\ SFD=-99\ dBW/m^2\\ EIRP=39\ dBW\ (Std),\ 42\ dBW\ (Ext)\\ Pad=0-15\ dB\ (1\ dB/step)\\ IBO/OBO=3/1\ dB \end{array}$ 

#### 2.2.3.2 VSAT

# SLDTS user monthly cost rate (VSAT) Term 1 < T < 3 years

# based on KR No. 15/YN.000/NET-00/97

SPEED (KBPS)	ORDER	TARIFF A US\$	TARIFF B US\$	TARIFF C US\$	TARIFF D US\$	TARIFF E US\$
19,2	1	2,100	1,300	1,700	1,800	1,500
	2 dst/cct	1,900	1,150	1,550	1,650	1,350
32,0	1	3,500	2,700	3,100	3,200	2,900
	2 dst/cct	3,300	2,550	2,950	3,050	2,750
38,4	1	3,000	2,200	2,700	2,700	2,400
	2 dst/cct	2,800	2,050	2,550	2,550	2,250
64,0	1	4,500	3,700	4,100	4,200	3,900
	2 dst/cct	4,100	3,400	3,800	3,900	3,600
128,0	1	7,300	6,500	6,900	7,000	6,700
	2 dst/cct	6,800	6,100	6,500	6,600	6,300
192,0	1	9,600	8,800	9,200	9,300	9,000
	2 dst/cct	9,000	8,350	8,750	8,850	8,550
256,0	1	12,000	11,200	11,600	11,700	11,400
	2 dst/cct	11,200	10,600	11,000	11,100	10,800
384,0	1	14,400	13,100	13,700	13,800	13,300
	2 dst/cct	13,400	12,350	12,950	13,050	12,550
512,0	1	17,800	16,500	17,100	17,200	16,700
	2 dst/cct	16,800	15,750	16,350	16,450	15,950
768,0	1	18,900	17,600	18,200	18,300	17,800
	2 dst/cct	17,400	16,500	17,100	17,200	16,700
1024,0	1	24,600	23,000	23,800	24,000	23,400
	2 dst/cct	22,600	21,500	22,300	22,500	21,900
1544,0	1	34,200	32,600	33,400	33,600	33,000
	2 dst/cct	31,200	30,350	31,150	31,350	30,750
2048,0	1	46,600	45,000	45,800	46,000	45,400
	2 dst/cct	42,850	42,180	42,980	43,180	42,580
Notes : Card Addition for 225 Voice or data						
Tariff A : SLDTS user monthly cost rate (VSAT) 1 (satu) circuit 2 (dua) host Terminal						
Tariff B : SLDTS user monthly cost rate (VSAT) point to point connectivity using 2 (two) existing host terminal						
Tariff C : SLDTS user monthly cost rate (VSAT) point to point connectivity using 1 (one)						
Existing Terminal and Z (two) new host terminal Tariff D : SLDTS user monthly cost rate (VSAT) point to point connectivity using 1 (one) new						
host terminal and prospective user						
Tariff E : SLDTS user monthly cost rate (VSAT) point to point connectivity using prospective user terminals						

Special discount will apply for a contract about 3 year.

# 2.3 Satelindo's Satellite Services

## 2.3.1 Satellite Technical Specifications

PARAMETER	PALAPA-C	UNIT
Frequency	C-Band	24
	Ku-Band	4
Polarization	Linear	
Total Transponder	28	Transponder
Total Ku-Band TWTA	6 (Linearized)	Pcs
(Include redundancy unit)		
Total C-Band SSPA	30	Pcs
(Include redundancy unit)		
TWTA Output Power	135 (Ku-Band)	Watts
SSPA Output Power		
Standard C-Band	21.75	Watts
Extended C-Band	26.75	Watts
EIRP	39(C-Band) & 51 (Ku-Band)	dBW
G/T		
C-ASEAN Beam	-1	dB/K
C-Asia Beam	-1	dB/K
Ku-North Beam	+3	dB/K
Ku-South Beam	+3	dB/K
Saturated Flux Density	-95	dBW/M^2
Weight at Separation	3000	Kg
Weight at Beginning of Life	1740	Kg
Life Time	14.7	Years
Power at EOL	3400	Watts

#### 2.3.2 Services

2.3.2.1 Transponder Leasing

Satelindo provides full or partial transponder capacity for analog and digital carriage on Palapa-C for telecommunications and video services users

#### 2.3.2.2 Telecommunications & Network Services

As Indonesia's largest private satellite, GSM network and international gateway operator, Satelindo provides total network solutions and services such as:

VSAT network operations (domestic and international) Internet access for ISP's and end users International Leased Lines Multimedia and Video Conference

# 2.3.2.3 Uplink and Turnaround Satelindo provides full digital and analog turnaround and uplink services.

2.3.2.4 TT & C

Satelindo provides full TT & C services for primary operations, launch support and backup for operators of the eastern hemisphere.

## 2.3.2.5 ASIALINK, Satelindo Telecast Service

ASIALINK delivers analogue or digital video services via PALAPA C2 and other international satellite capacity such as Intelsat, PanAmsat and AsiaSat.

ASIALINK capabilities:

Regional Telecast Network for news and sport event from teleport facility Satellite Uplink, Downlink and Turnaround at Daan Mogot & other strategic location. Digital Video Compression System News Production and Distribution (In Cooperation with Asiawork & APTN) Mobile Uplink Facility Temporary Uplink License Video Conference System

## 2.3.2.6 Palapa DigiBouquet

Palapa DigiBouquet is an open and neutral DVB compliant platform, which enables services and content providers to rapidly and cost effectively distributes video and data content via PALAPA-C satellite using one or and multiple channels system (MCPC/ Multiple Channels Per carrier ). This service designed for TV Broadcasting Network, DTH Operator and Video/Internet Content Provider.

Palapa DigiBouquet services :

Digital Channel Video DTH System & Operation Distance Learning and Training Service Video on Demand News Information

2.3.2.7 PalapaNet, The High-speed Internet Access

PalapaNet offers Internet access services throughout Asia via state of the art of satellite terminal system. The varies from Single Channel per Carrier (SCPC), normally reserved for larger bandwidths, to TDMA Hybrid or shared satellite system for small to mid-sized bandwidths, and Digital Video Broadcast system (DVB/IP) normally reserved for push-type client or clients that can be connected via a terrestrial return path to the Internet.

PalapaNet Range of Services :

i-Link : SCPC (Single Channel Per Carrier)

Point to point Internet service designed for the midsize to very large enterprise.

## i-Connect : Shared Internet Link

Point to point Internet service designed for the small to midsize enterprise using the Internet gateway-sharing concept to provide efficiency & value to customers while maintaining high level service quality.

## i-Cast : DVB - IP Gateway

Point to Multipoint Concept for Internet & content distribution using a bandwidth sharing mechanism of DVB/IP platform.

## Appendix 5.2.1.

## Current Situation of Maritime Telecommunication System (Site Survey)

#### **TG. PINANG Area (May 7 - 9, 2001)**

#### (SROP SEI KOLAK KIJANG)

The SROP was newly built at Kijang in Bintan Island in June 2000. The SROP building was newly built with the national budget and the apparatuses were transferred from Tg. Pinang SROP. Next to the SROP, the new office building of Tg. Pinang DISNAV is under construction (they will shift in June 2002). The present DISNAV building will be used by the SAR Tg. Pinang, which is now within the Naval Base.

- 1. Class: 3rd
- 2. Operation: 16 hours

3. Frequencies:

-	
(Mobile)	MF(TP, DSC)
	HF(TG,TP, DSC, NBDP)
	VHF(TP, DSC)
(Fix)	HF(TG,TP)
4. Personnel:	16

- 5. Remarkable Conditions of Equipment and Facilities
- (1) GMDSS apparatuses have already been equipped.
- (2) The HF receiver (made in 1997) has big noises.
- (3) One unit of VHF TX/RX is broken.
- (4) The telephone networks are connected not with cables but with wireless system and the antenna and VHF antenna is so close that VHF is interfered with telephone when operated.

#### 6. Maintenance

- (1) There are few measuring instruments.
- (2) Spare parts are few, especially those made by SAILOR are difficult to get.

#### 7. Requests

(1) Improvement of noise of HF receivers;

#### (2) Supply of sufficient spare parts;

#### 8. SAR Operation



#### 9. Others

(1) Sei Kolak Kijang SROP was newly founded with HF and VHF Console (made by SAILOR), while Tg. Pinang SROP is in operation as a class IV SROP with the remaining VHF TX/RX. As a result, there are 3 SROPs in Bintan Island. The necessity of continuing Tg. Pinang should be studied.

#### (SROP TG. UBAN)

1. Class:	3 rd
2. Operation:	14 hours
3. Frequencies:	
(Mobile)	MF(TP)
	HF(TP)
	VHF(TP)
(Fix)	HF(TP)

6

- 4. Personnel:
- 5. Remarkable Conditions of Equipment and Facilities

(SROP)

- (1) VHF TX/RX (Philip): not usable
- (2) HF All-wave RX (YAESU): not usable
- (3) HF TX/RX(PYE): broken
- (4) Dipole Antenna (Dipole): broken
- (5) Antenna Tuner (YAESU): broken
- (6) GMDSS: not yet equipped with

(SAR COM)

- (1) Most of the apparatuses at the station are in good condition. One of the two E/Gs cannot be started automatically and operated manually. The battery charger is broken.
- (2) Most of the apparatuses at ARMADA/PLP are in good condition. The auto-starter of the one E/G is broken and a battery charger of the other is broken. The fuel tank cannot be used because its roof is corroded.
- (3) For the detail, see the Final Report on SAPS for the Maritime SAR Telecommunication System Project (March 2000, JBIC).
- (4) The vessels of ARMADA/PLP usually communicate with Tg. Uban SROP or Jakarta SROP. In case of emergency, operators of the SROP go to the ARMADA/PLP (about 100 meters from the SROP) and make SAR communication using the SAR Console there.

Note: Related Diagram is on the next page.

#### 6. Requests

(1) The apparatuses at the SROP are worn out and often get in trouble. They should be replaced.



(2) Sufficient spare parts should be prepared.

#### (SROP BATU AMPAR -BATAM)

- 1. Class: 3rd
- 2. Operation: 24 hours
- 3. Frequencies:

(Mobile)	MF(TP)
	HF(TP)
	VHF(TP)
(Fix)	HF(TP)

4. Personnel: 11

5. Remarkable Conditions of Equipment and Facilities

- (1) GMDSS: Already equipped
- (2) One of MF/HF TX/RX is broken.
- (3) One all-wave receiver is broken.

(4) Both of the two Radio Telephone Interface are broken.

#### 6. Requests

- (1) The SROP had been operated for 14 hours but since 1998, it has been operated for 24 hours because vessel traffic in the Strait of Singapore is busy and there have been many accidents and incidents such as groundings, collisions and crimes and cargo operations are being made round the clock in the Port of Batam as an international port. Under these circumstances, it is desirable that the SROP will be up-graded to Class I or Class II along with sufficient facilities and staff.
- (2) Worn-out apparatuses should be replaced.
- (3) Sufficient spare parts should be kept ready.

#### DUMAI Area (May 10 - 11, 2001)

#### (SROP DUMAI)

- 1. Class: 1st
- 2. Operation: 24 hours
- 3. Frequencies:

(Mobile)	MF (TG)
	HF (TP, TG, DSC, NBDP)
	VHF (TP, DSC)
(FIX)	HF (TP, TG)

4. Personnel

Chief:1Operator:46Technician:13

Total: 60

#### 5. Remarkable Conditions of Equipment and Facilities

#### (Transmitting Station)

- (1) As for each one of MF and HF TX and two TXs for SAR, exciter units are not working.
- (2) E/Gs (40KVA) are worn out and should be replaced with new ones.
- (3) As for antenna systems, coaxial cables are corroded at some places, which should be replaced with new ones.

(Receiving Station)

- (1) The telephone repeater of each receiver has been damaged by lightning and cannot be connected with vessels through public lines. Steps should be taken to cope with the situation.
- (2) The VHF Console is not usable due to damage by lightning. Communication is maintained by direct operation of transmitters and receivers, but all of the three units are old-fashioned and worn out, and they are sometimes unstable, according to the technicians. The VHF TX/RX should be replaced with new ones including antenna system and consoles.

#### 6. Requests

(1) VHF Coverage

Rupat Island in front of Dumai Port separates the port from the Straits of Malacca. Therefore, in the port we cannot communicate with the vessels passing the Straits. The SROP and DISNAV hope that a VHF repeater station should be installed on the island.

(2) Spare Parts

There are few spare parts and have difficulty with maintenance. It is desired to have sufficient amount of spare parts, and unit type spare parts rather than individual ones.

(3) It is desired to get technical training with as higher level as possible. The priority order of desired types of training is as follows:

Training at manufacturers;

Training at Jakarta Training Center; the Center should be equipped with all the necessary apparatuses and instructors from manufactures should be included in the instructing staff;

OJT at each SROP by visiting instructors.

Above-mentioned instructors should have high-leveled technology, knowledge and skill with the apparatuses concerned.

(SAR Operation)

- 1. In Dumai Area, the ADPEL/KPLP office in which SAR COM Console had been installed was relocated in 1988, but the Console remains at the original site. Therefore, the SAR COM equipment has been powered off, so the SAR system has not functioned at all in Dumai Area.
- 2. For the detail, see the Final Report on SAPS for the Maritime SAR Telecommunication System Project (March 2000, JBIC).

#### 3. Actual Situation of SAR

Upon receiving distress information, Dumai SROP reports to ADPEL/KPLP and DISNAV. As there is no local organization of BASARNAS, SAR activities are coordinated by ADPEL/KPLP. ADPEL/KPLP has a limited number of small boats most of those are not usable due to troubles, so they have to ask other organizations such as DISNAV to operate their vessels.



#### (DISNAV, ADPEL, Navigation Ships)

#### 1. DISNAV Dumai

DISNAV has HF(ICOM) to keep contact with main lighthouses.

2. ADPEL Dumai

ADPEL originally had SAR COM facilities, but not at present. Since the office building was shifted, they had been left at the old building until they were kept at the Transmitting Station, and therefore they have no effective communication facilities.

3. Navigation Ships

DISNAV Dumai has 6 Navigation ships. Among them, made survey on communication facilities of the aid tender KARAKATA, 589 GT built in 1972.

- (1) Equipped with VHF, MF and HF. The apparatuses were replaced 2 years ago for GMDSS (Sailor).
- (2) Normally communicates with Dumai SROP, while depending on sea areas, also contacts with coastal stations of Singapore and Malaysia.

## **PALEMBANG Area (May 14 – 16, 2001)**

#### (SROP PALEMBANG)

1 st

- 1. Class:
- 2. Operation: 24 hours
- 3. Frequencies:

(Mobile) MF (TG, TP): 500 kHz not working due to transmitter's trouble HF (TP, TG)
 VHF (TP)
 (GMDSS: not installed yet)
 (Fix) HF (TP, TG)

#### 4. Personnel

Chief:	1
Operator:	18
Technician:	9
Administratio	n: 2
Total:	30

5. Remarkable Conditions of Equipment and Facilities

(Transmitting Station)

- (1) Two MF Transmitters, the Antenna Matching Unit Control and Antenna Exchanger were damaged by lightning six month ago. They could not be repaired due to the lack of spare parts, so MF has not been operated.
- (2) One of the two transmitters for fix communication was damaged by lightning 3 months ago but they have not been repaired due to the lack of spare parts.
- (3) Two Local Terminal Units of the Remote Control Rack are not working.
- (4) Two E/Gs are in operation but worn out (made in 1969) and no spare parts at all. They have to be replaced with new ones as early as possible. The new ones should be changed to 380 volt including PLN power.
- (5) Antenna System
  - No. 1 Ant. (T-type)

A kite cut a line. It was repaired but is not be used because MF transmitter is broken.

- No. 2 Ant. (4094)
   Burned up and fallen down by a spread of fire from surrounding grasses.
- No. 3 Ant. And No. 4 Ant. (Fan type) Good.
- Inverted L Type

Antenna Matching Unit cannot be usable due to damage by lightning.

- Multi Double Ant.
   Not being used due to poor efficiency.
- The SROP is surrounded with residential area and children are playing with kites. Strings of kites flied by the children are seen entangled at many places of the antennas.

(Receiving Station)

- (1) The Controller of the Fix Com. Console is damaged but cannot be repaired due to the lack of spare parts.
- (2) VHF Transmitter/Receiver was damaged by lightning six months ago and not be usable. A simplified transmitter/receiver (ICOM) is being used temporarily.
- (3) One unit of two receivers in the HF TG Console is not working.
- (4) The receiving unit and the Signal Controller of MF TG Console are broken but no inconvenience because MF is not operated.
- (5) The power of the 800 MHz SS-PM is decreased because of the shortage of source power but the network is managed to be kept.
- (6) Two E/Gs are worn out (made in 1969) and no spare parts are available. They should be replaced with new ones as early as possible.
- (7) The Active Ant. (HE-005) is not used because of low efficiency.
- (8) The Teleprinter had been removed because it did not work and cannot be repaired.

(VHF Relay Station Tg. Buyut)

- (1) The Station is located about 60km north of the Receiving Station and a staff member is stationed for ten days in turn. The access is only by water and they use boats for changing the staff of the neighboring Pilot Station.
- (2) Three transmitter/receivers are in operation but one unit is low in sensitivity of receiver and another one is low in transmitting power. Neither one can be repaired due to the lack of spare parts.
- (3) One of the two TX/RX units of 800MHz SS-PM is not working because its power source part is in trouble.
- (4) The Inverter of CVCF is in trouble, so direct jump method is employed.
- (5) One unit of three E/Gs is in trouble and not usable. All the AVRs are unstable. The Control Panel is in trouble and it is manually operated because the remote control system does not work.

#### 6. Training

The Requests of the SROP in Order of Priority:

- (1) Training at Manufacturers;
- (2) Training by technicians from Manufacturers at the Training Center Jakarta;

(3) Training for all the local technicians of the SROP by visiting experts. All the above training should be given, if possible.

#### 7. Requests

- (1) Distribution of spare units and parts is strongly desired.
- (2) The early establishment of GMDSS facilities and replacement of worn-out apparatuses are strongly desired.
- (3) The replacement of E/G is also strongly desired.
- (4) Rehabilitation of Antenna system at the TX Station is desired.
- (5) In order to expand the coverage and to reduce the maintenance cost of Tg. Buyut Relay Station, the study of the feasibility of establishing VHF TX/RX at Muntok (Class IV) which will be controlled remotely from the Receiving Station, is desired.

#### **Receiving Station – Muntok**

Distance: about 100km; Height of Muntok from the sea level: about 75m; Merits of Muntok:

- VHF Coverage will be expanded;
- PLN power will be used;
- Speedy passenger ships are available from Palembang for Muntok (2.5 hours) every day.

#### (SAR Operation)

- 1. Upon receiving distress information, Palembang SROP reports to SAR Palembang (Coordinator), ADPEL Palembang and DISNAV Palembang.
- 2. ADPEL has small boats only and ADPEL/HBM boats are operated within the port. ADPEL/KPLP boats are operated from the port to the estuary and NAVIGASI ships are operated on the outer sea.



## TRAINING CENTER TG. PRIOK (May 25, 2001)

#### 1. Outline

Apparatuses for training was set in a room of the Transmitting Station of Jakarta SROP in 1987 to function as a Training Center. However, no staff was employed for the purpose and as a matter of fact, the staff of the Transmitting Station are taking care of it as a part of their job.

- 2. Remarkable Conditions of Facilities and Equipment
- (1) VHF Radio (25W) is broken.
- (2) Display of Signal Controller of the Training Console is broken.
- (3) MF Transmitter is partially in trouble. It can be repaired but has not been repaired because no training has been held for several years.
- (4) There is a room and equipment for Morse training but in this GMDSS era, their utilization for other purpose should be considered.

3. Practice of Training and Problems Concerned

- (1) Since the Training Center was established, only for the first several years, a weeklong training had been given twice a year for 10-15 participants.
- (2) Since 1995 no training has been held due to the shortage of budget.
- (3) No records for the past training have been kept at all in the Center.

4. Requests

- (1) Sufficient supply of training equipment and travelling fee;
- (2) To establish sufficient training system also in the fields of organization and staff such as appointment of personnel in charge of training.

(In a case where the Maintenance Center is established in the future, it is necessary to separate from the Transmitting Station and the responsibility for maintenance should be made clear.)

## ARMADA PLP TG. PRIOK (May 25, 2001)

1. Outline of ARMADA PLP

The ARMADA PLP is under the direct control of DGSC. Five ARMADA PLP were established in five bases in Indonesia and posted as the major forces for guard and rescue operation in Indonesia. Each ADPEL also has a coast guard fleet, but the chain of command is different.
#### 2. Fleet at Each Base

Tg. Priok	9 vessels (Class 2)
Tg. Uban	1 vessel (Class 3), 2vessels (Class 4), 7 vessels (Class 5)
Surabaya	1 vessel (Class 3)
Ambon	Does not function as a fleet base/
Bitung	No fleet is deployed.
(According to	the Chief of ARMADA PLP, it is necessary to have four more bases in

the future, Belawan, Makassar, Balikpapan and Sorong.)

#### 3. Communication of Fleet

In a sea area near Tg. Priok, VHF keeps communication at the base directly with patrol vessels.

Patrol vessels in a distant area, communicate with nearby SROP by VHF, MF or HF.

Each vessel in operation is supposed to report their position at 1200 to ARMADA PLP via SROP. The SROP that has received the report sends it to ARMADA by telephone. (each vessel could contact directly with SAR COM before)

#### 4. Command in SAR Operation

ARMADA PLP receives distress information from SROP or BASARNAS. The Chief of ARMADA PLP issues the commands to the fleet taking into consideration of the case and dispatch of the vessels. After the fleet arrives at the spot of distress, the Head of ADPEL or SAR (BASARNAS) depending on the case, will take over the on-scene commander. On the other hand, ADPEL will take over on-scene commander in all oil spill incidents.

- 5. Requests
- (1) Since the transfer of the office building, SAR COM has not been available. It is very inconvenient and its rehabilitation should be done by all means. Upon rehabilitation, it should be such system as easy to operate and maintain as far as possible.
- (2) Some patrol vessels have no GMDSS equipment on board and some others have broken MF/HF and the only communication means is VHF. Those worn-out apparatuses should be replaced as early as possible.

#### **BELAWAN Area (May 28 – 29, 2001)**

#### (SROP BELAWAN)

1. Class:

2. Operation: 24 hours

1 st

3. Frequencies:

(Mobile)	MF (TG, TP)
	HF (TG, TP, DSC, NBDP)
	VHF (TP, DSC)
(Fix)	HF (TP, TG)

#### 4.Personnel:

Chief:	1
Operator:	26
Technician:	17
Administrator:	4
Total:	48

5. Remarkable Conditions of Equipment and Facilities

(Transmitting Station)

- (1) Power supply parts of one MF transmitter and two HF transmitters are broken. They were burned down due to abnormal high voltage of PLN power.
- (2) One transmitter for SAR had been broken up to last year. It was repaired recently and in a good condition so far.
- (3) Towers and antennas are in good condition but coaxial cables are corroded at some places, so they should be replaced.
- (4) Two E/G (55 KVA) should be replaced with new ones because they were made in 1969.

(Receiving Station)

- (1) One receiver of MF TG Rack is broken.
- (2) The UPS of Fix Com. Console sometimes drops.
- (3) The UPS of HF TG/TP/NBDP Console is broken.
- (4) AVR sometimes becomes unstable.
- (5) As for SAR Equipment:

LOX is broken;

The receiver of Remote Control Rack is broken;

The Power Supply part of one DRSC is broken.

(6) Two units of E/G (10 KVA) were made in 1969 and worn out. The house for Power Supply is remarkably damaged and it is located too far from the building of SROP.

It is necessary to replace E/G with big capacity (30KVA) and to rebuild the house for Power Supply.

- (7) Antennas have not been changed for a long time, so they are remarkably corroded except for those for SAR.
- (8) The OB light on the 65m-high tower for the TDMA antenna and VHF antenna has been equipped with a 110V lamp, which is difficult to obtain locally. Therefore, the step-down transformer has been detached to operate the OB lights on 220V.

6. Requests

- (1) To change VHF transmitter to multi-channel system and increase channels.
- (2) As for Fix Com. with Jakarta, receiving sensitivity of both sides is weak. It should be improved in the near future.

The frequencies in use at present:

Jakarta to Belawan 11,060 kHz, 8,110 kHz

Belawan to Jakarta 13,661 kHz, 17,615 kHz

- (3) E/Gs of both of the Transmitting Station and the Receiving Station should be replaced with new ones. The AVR should be designed such one as to function well even under an abnormal high voltage of the PLN power.
- (4) Antenna system of the Receiving Station and coaxial cables of the Transmitting Station should be replaced.
- (5) For the maintenance of antennas and towers, a pair of handy radiophones is desirable.
- (6) To supply sufficient spare parts.
- (7) To replace old air-conditioners with new ones.

#### (SAR COM)

- 1. KANWIL Medan
- (1) Three SROP members are working in turn.
- (2) A part of SAR Console Display is unstable but good as a whole.

2. SAR Medan

- (1) SAR Medan is located within Medan Airport and operated for 24 hours in three shifts with each two persons. Communication with BASARNAS Jakarta are being made by HF SSB (KENWOOD).
- (2) The radio equipment for VHF link of SAR was installed in BASARNAS Medan but the apparatuses are broken and no use, so they are kept in the storage.
- 3. ADPEL/KPLP Belawan
- (1) The Console installed in KPLP is unable to control the VHF transceiver, because the LOX channel unit installed at the Receiving Station has been broken.

(2) The communication with their vessels are kept by VHF, SSB transceiver (ICOM).

#### 4. ADPEL/HBM Belawan

The DRCS on the corner of the office is broken and no use at present.

#### **TELUK BAYUR Area (May 30 - 31, 2001)**

#### (SROP TELUK BAYUR)

- 1. Class: 2nd
- 2. Operation: 24 hours
- **3. Frequencies:**

-	
(Mobile)	MF (TG, TP)
	HF (TG, TP)
	VHF (TP)
	GMDSS: not yet be installed.
(Fix)	HF (TP, TG)
I. Personnel	

4

Chief	1
Operator	21
Technician	6
Administrator	3
Total	31

5. Remarkable Conditions of Equipment and Facilities

- (1) SROP Teluk Bayur was located at the same place as the present DISNAV Teluk Bayur is, but transferred to the present place in 1985 because radio wave environment has been worsened.
- (2) SROP Teluk Bayur has been classified as 2nd class SROP for a long time and 2nd Class SROP should be operated with separate transmitting site and receiving site. However, as a matter of fact the SROP has been operated at a single site where the transmitters and the receivers are collocated. Since then no specific projects have been implemented, so main radio apparatuses are worn out (made in 1960's). Spare parts also are unable to procure at present because they are vacuum tube types. The SROP has been managed to be in operation with their efforts for maintenance but it seems close to the limit. All of the apparatuses must be replaced with new ones as early as possible.
- (3) As the site fit for the Transmitting Station was decided as a result of the survey made by DGSC in 1997, it procured the site of about 15,000 m² and constructed a station building (about 230 m), a house for power source and a residence for two

families. However, construction of the Transmitting Station was suspended because the budget for that could not be obtained. It is necessary to revive and promote the Transmitting Station Separation Scheme as early as possible along with establishment of GMDSS.

- 6. Requests from Chiefs of DISNAV and ADPEL Relating to the Improvement of SROP Teluk Bayur
- (1) The Port of Teluk Bayur (Padang) is a port for loading crude oil, coal and lumber. Accordingly, many vessels not only of Indonesian flag but also freighters and tankers of foreign flags mostly from Asia are coming in and going out. (in 1999, a total of 1,510 vessels and 9,021,838 GT, in 2000, a total of 1,510 vessels and 8,568,136 GT)
- (2) The Port is located in the center of West Sumatra surrounded by a lot of resort places and therefore large passenger ships (about 15,000 GT with max. 2,000 passengers) are in operation once a week from Jakarta via Teluk Bayur (Padang) to Sibolga.
- (3) By the old-fashioned system of SROP, it is impossible to connect radiotelephone of navigating vessels with the Public Telephone Networks. Many passengers on board ships coming in close to the Port have raised claims that they cannot get in touch with those concerned on land.
- (4) Under the above circumstances, it is indispensable to drastically improve the Telecommunication System of SROP Teluk Bayur, which is essential for the vessel traffic safety in and around the sea of Padang.
  - To separate Transmitting Station to be a SROP to keep efficient communication and satisfactory watchkeeping;
  - To install GMDSS apparatuses to meet the requirements of international conventions;
  - To replace worn-out apparatuses along with the above.
- 7. Requests of the SROP
- (1) Separation of Transmitting Station;
- (2) Renewal of apparatuses and to fit for GMDSS;
- (3) Renewal of E/G and power up (30KVA)
- (4) Replacement of antenna lines and coaxial cables;
- (5) Improvement of earth (against frequent lightning)
- (6) Along with the renewal of apparatuses,

Training of operation and maintenance,

Supply of sufficient spare parts,

Provision of sufficient measuring instruments.

#### MAKASSAR Area (May 28, 29, 2001)

#### (SROP MAKASSAR)

- Class: 1st
  Operation: 24 hours
  Frequencies:

   (Mobile)
   MF (TG), HF (TG), MF/HF (TP), VHF (TP), NAVTEX, DSC, NBDP
   (Fix)
   HF (TP, TG)

  Personnel

   Chief:
   1
  - Operator: 29 Technician: 17 Administrator: 10 Total: 57

5. Remarkable Conditions of Equipment and Facilities

(Transmitting Station)

- (1) TX-4 MF (TP) 1 kW Transmitter; PA part is in trouble.
- (2) No. 1 E/G (50KVA) is broken.
- (3) Routine maintenance is well done for every apparatus. E/G trial  $\dot{s}$  made every day.

(Receiving Station)

- (1) No.4 Ant. is not connected. Other facilities and equipment are well maintained.
- (2) Spare parts are kept in carbon boxes.
- (3) The radio wave environment of the present site is very bad because developing industrial areas with many large vessels and related facilities surrounds it. Furthermore, the site is too limited to ensure the antenna system. Accordingly, transfer of the Receiving Station is indispensable. They are planning to transfer the Receiving Station to the present Transmitting Station site and transfer the Transmitting Station to a new site. Applicable sites have already been selected.

(KANWIL)

- (1) One of two Power Units for SAR DRCS is broken, so 2G network to the Receiving Station is unusable.
- (2) 121.5 MHz (VHF) of SAR Console has much noise.

(SAR Operation) The SROP sends SAR information to ADPEL, HBM, KANWIL and SAR.

#### 6. Requests

As mentioned above, transfer of the Receiving Station is requested.

#### MANADO/BITUNG Area

#### (SROP BITUNG)

- 1. Class: 1st
- 2. Operation: 24 hours
- 3. Frequencies:
  - (Mobile) MF (TP, TG), HF (TG, TP, DSC, NBDP), VHF (TP, DSC)(Fix) HF (TP, TG)
- 4. Personnel

Total: 48

5. Remarkable Conditions of Equipment and Facilities

(Transmitting Station)

- (1) Receiving and Power Source Units of Supervisory Console are broken.
- (2) SAR 1kw HF Transmitter is broken.
- (3) The cleaning system of one of the two E/Gs (50KVA) is broken.

(Receiving Station)

- (1) One unit of two TX Controllers of MF TG Console is broken.
- (2) Signal Selector and DF of Search and Monitor Console are broken.
- (3) NRD-95 Receiver and Local Terminal Unit (NCC-300L) of Remote Control Rack are broken.
- (4) Power Source of MTRX (SAR) is broken.
- (5) One of two NBDP Printers is broken.
- (6) Power Source of TX/RX to TALISEI for MFB is broken.
- (7) Antenna System

No. 1 Antenna (Double-Doublet) to JKT; Matching is not sufficient due to the change of frequency.

- (VHF Station/Repeater Station) (Makawemben Station)
- (1) 2 GHz band line for SAR between Bitung and Manado; DRCS is broken and not

function as a relay station.

(2) E/G: Started manually; capacity of batteries is not enough to get started.

(KANWIL Manado)

- (1) DRCS-SS has been broken since 1995.
- (2) SP panel and receiving unit of SAR Console (II-2) are used at Manado SROP.
- (3) All the equipment for SAR is unusable.

#### (ADPEL Bitung)

(1) SAR Console:

Dialing Unit is broken.

VHF Tele-controller is not usable because the power source below is broken.

(2) CVCF (1KVA): not usable because there are no batteries and the inverter is broken.

(SROP MANADO) Class IV-a

#### (1) SSB TX/RX (ICOM) IC-M700

TX (kHz): 2182, 3180, 6215.5, 6515.5, 6515.1, 4446.5, 5381.5

RX 2182, 2080, 6215.5, 6209.3, 4446.5, 5381.5

- (2) Two units of Transceivers are broken.
- (3) Personnel: 4
- (4) GMDSS should be equipped.
- 6. Accident of CAHAYA BAHARI

0148, June 29, 2000: Distress information from the ship to the owner;

The owner reported to ADPEL Bitung; ADPEL sent it to SROP Bitung;

SROP broadcast the information to navigating ships in the vicinity and at the same time

reported to BASARNAS, KKR, SROP Manado, Police and DGSC. 11 persons were saved.

7. SAR Operation

When SROP get distress information, it is reported as follows:

SROP → ADPEL (HMB) → ADPEL Ships → SAR Menado → BASARNAS, NAVY

Broadcast Ships in the vicinity

→ DGSC, Police (if possible)

#### 8. Problems

(1) SAR Com. Systems of both SROP Manado and Bitung are not functioning at all.

- (2) Spare parts are kept in piled up boxes in another storage house and the place is not good in consideration of humidity.
- (3) The Port of Manado is now under development.

#### SEMARANG Area (June 11, 12, 2001)

#### (SROP SEMARANG)

- 1. Class: 2nd
- 2. Operation: 24 hours
- 3. Frequencies

-	
(Mobile)	MF (TG, TP)
	HF (TG, TP, DSC, NBDP)
	VHF (TP, DSC)
(Fix)	HF (TP, TG)

4. Personnel

Chief:	1
Operation:	22
Technician:	13
Administrator:	6
Total:	42

#### 5. Remarkable Conditions of Equipment and Facilities

(Transmitting Station)

- (1) The MF Transmitter has not been used since 1997 due to a trouble of PA unit. No spare parts have been existed since the beginning for some reasons.
- (2) TX 3 of Antenna Switching Matrix cannot be switched.
- (3) Transmitting part T1 of Multiplex Radio Relay (400 MHz) is in trouble.
- (4) One E/G is broken and the other can be operated but worn out.

#### (Receiving Station)

- (1) VHF Console is in good condition except for indicators.
- (2) During black-out, memory of Receiver Controller gets out while changing to E/G, so resetting is necessary every time.
- (3) One Receiver (DSC) of NBDP is broken.
- (4) Morse Transmitter is broken in RC & TX Rack.
- (5) Search & Monitor Console is not in use.
- (6) Two units of Tape Recorder are broken.
- (7) Tele-controller is broken.

#### 6. Requests

- (1) Supply of sufficient spare parts.
- (2) Technical training not only for technicians but also for operators.
- (3) Supply of sufficient measuring instruments.
- (4) There are no transportation means and very inconvenient for maintenance. Arrangement of van-type vehicles is strongly desired.
- (5) It is desired that NBDP will be improved to be such system as can be connected vessels with public telephone networks as radiotelephone.

#### 7. Others

- (1) Both of the Transmitting Station and the Receiving Station were transferred from port area. The buildings are in good condition. Maintenance of equipment is comparatively good though there are some partial troubles. Things are in good order in the site and inside the buildings.
- (2) The site for antennas of the Transmitting Station was covered with overgrown weeds. It is advisable that weeds around towers and stays and passages should be taken out.
- (3) It is felt that storage management will be easier by attaching labels with names, specifications, date of use, etc. of parts.

(ADPEL)

- (1) Boats under ADPEL are small and without communication equipment both for HBM and KPLP.
- (2) The Port of Semarang has been upgraded from 3rd to 2nd Class since May, 2001 and it is under development. Accordingly the following is desired:

Vessels under ADPEL should be larger.

Vessels should be equipped with communication equipment.

Training for handling of dangerous cargoes.

#### (SAR Operation)



SURABAYA Area (June 13 - 15, 2001)

#### (SROP SURABAYA)

- 1. Class:
- 2. Operation: 24 hours
- 3. Frequencies:

(Mobile)	MF (TP, TG)
	HF (TP, TG, DSC, NBDP)
	VHF (TP, DSC)
(Fix)	HF (TP, TG)

1 st

4. Personnel

Chief: 1 Operator: 7 Technician: Administrator: 65

5. Remarkable Conditions of Equipment and Facilities

(Receiving Station)

(1) Noises caused by city activities are very big and as the environment for a receiving station, it is far from suitable. Furthermore, the sites for transmitting and receiving stations are too limited to ensure adequate antenna system.

- (2) The Crystal for Ch. 22 of VHF is broken and it cannot be repaired because there are no spare parts.
- (3) The Multiplex Radio (400 MHz) to the VHF Repeater Station has not been usable for about 4 years due to interference. Therefore, it is necessary to change the frequency.
- (4) The KANWIL Office was moved but the equipment was left at the old office. Ever since the operation at the KANWIL has been remained stopped. Several pieces of equipment are kept or used at the Receiving Station.
- (5) Rats sometimes bite cables in the pits and give troubles to the functions of equipment.
- (6) In order to expand coverage of VHF antenna, it is transferred from T4 (H: 25m) to T3 (H: 70m) three years ago.

(Transmitting Station)

- (1) The PA unit of a 1kw MF Transmitter (JRS-108P) has been decreased its power down to 250 w due to damage by lightning.
- (2) The Exciter unit of a HF Transmitter (JRS-106B) for SAR is broken. Other transmitters of JRS-106B have sometimes had the same troubles as this.
- (3) The Voice Frequency Telegraph for Philips Transmitter is not being used.
- (4) The Regulator of E/G (55 KVA) is unstable.
- (5) T4 Tower has a little list toward antenna.
- (6) The Antenna Wire Adjuster for T1 Tower cannot be moved.
- (7) Conditions of Transmitters in Use

TX No.	Used for	Frequency (kHz) in Use at the Survey
1	MF TG	CW 500 (Less output power)
2	MF TG	CW 500
3	MF/HF TP	SSB 6504
4	MF TP	SSB 2182
5	HF TP/TG	SSB 13110
6	HF TG	CW 8461
7	HF TP	SSB 8794
8	FIX 1	SSB 5316
9	DSC	FSK 8436.5
10	NBDP	FSK 12580
11	FIX2	SSB 9110

(The Plan of Transfer)

(1) The site (W3) proposed as the best in 1997 could not be procured because the land cost was too expensive.

- (2) A new site seemed to be suitable was found three years ago. It is a field of mango trees and miscellaneous small trees located about 15 km south west from the present Transmitting Station next to a golf course. The land cost at present is unknown. The SROP will make re-survey under the instruction of DGSC.
- (3) Basic Draft Plan



(SAR COM)

- (1) Most of the SAR equipment does not function after the relocation of the KANWIL office and troubles in the DRCS and LOX equipment. Some equipment is kept or used at the Receiving Station.
- (2) For the detail, see the Final Report on SAPS for the Maritime SAR Telecommunication System Project (March 2000, JBIC).

#### (ADPEL)

- (1) ADPEL Surabaya and the Port of Surabaya: Class 1st
- (2) Organization: 3 Divisions; HBM, KPLP and Vessel Traffic; KPLP is guarding wharf.
- (3) Vessels: HBM 15 (7-10m), KPLP 3 (12-15m).
- (4) Personnel: Total 170.
- (5) SAR Operation: ADPEL coordinates and inform to SAR, ARMADA, Navy and if necessary, to companies.

#### (ARMADA)

- (1) Only one boat of 21.5m (speed 7 kts) with 20 crewmembers.
- (2) Personnel: Total 50
- (3) COM. equipment: ICOM M700 (13,100kHz) + VHF

#### BALIKPAPAN Area (June 12, 2001)

#### (SROP BALIKPAPAN)

- 1. Class; 2nd
- 2. Operation: 16 hours
- 3. Frequencies

-	
(Mobile)	MF (TP, TG)
	HF (TP, TG, DSC, NBDP)
	VHF (TP, DSC)
(Fix)	HF (TP, TG)

#### 4. Personnel Formation

Chief:	1
Operator:	14
Technician:	7
Administrator	2
Total:	24

#### 5. Remarkable Conditions of Equipment and Facilities

#### (Transmitting Station)

- (1) All the equipment is well maintained as a whole and there are no troubles with transmitting equipment.
- (2) Antennas: Matching Unit for No. 2 Ant. and one unit of three Fan Ant. units are broken.
- (3) E/G: Both are aged (made in 1971) but well maintained.
- (4) Spare parts are put in good order on racks.
- (5) One AC in the transmitters' room is broken.

#### (Receiving Station)

- (1) Well maintained except for minor troubles and no such troubles as to impede operation.
- (2) Spare parts are put in good order.
- (3) The Console for SAR is not broken but not used.
- (4) 400 MHz line for MFB (to Tg. Mangkalihat ) is good but not used.
- (5) MFB Supervising SW Equipment Type 250 and Remote Monitor Equipment are good but not used.
- (6) Two units of E/G are aged (1971) but well maintained.

(ADPEL)

- (1) The room once used for SAR Console is used for other purpose and its power source is off.
- (2) According to the ADPEL, communication is well kept with Telecom lines. There are no operators for SAR equipment. But it would be better to have a hot line with SROP.
- (3) Personnel: 79.

#### SAMARINDA Area (June 11,2001)

#### (SROP SAMARINDA SROP)

- 1. Class: 3rd
- 2. Operation: 12 hours
- 3. Frequencies:

(Mobile)	MF (TP, TG) GMDSS not installed
	HF (TP) VHF (TP)
(Fix)	HF (TP)

4. Personnel

Chief:	1
Operator:	7
Technician:	1
Total:	9

5. Remarkable Conditions of Equipment and Facilities

(Receiving/Transmitting Station)

- (1) The SROP is located about 30 km upriver of MAHAKAM River from the sea and so maritime telecommunication service for A1 Area cannot be done sufficiently.
- (2) When coverage of VHF is not enough, the Pilot Station on a small island near the shore acts as a relay station.
- (3) Black-out of PLN takes place several times a week and lasts 3 hours at the longest.
- (4) Two E/Gs (10KVA) are worn out and the power is decreased. Batteries are uncharged.
- (5) As for SAR, telephone and Fax are used with ADPEL.
- (6) Maintenance is well done as a whole.

#### 6. Others

KPLP has only one vessel. NAVIGASI has 4 but one of them cannot be operated.

#### BANJARMASIN Area

#### (SROP BANJARMASIN)

- 1. Class: 2nd
- 2. Operation: 16 hours
- 3. Frequencies: (Mobile) MF (7)

(Mobile)	MF (TP, TG) HF (TP, TG) VHF (TP)
(Fix)	HF (TP, TG)

#### 4. Personnel

Chief:	1
Operation:	13
Technician:	7
Administrator:	1
Total:	21

5. Remarkable Conditions of Equipment and Facilities

GMDSS is not equipped.

(Receiving Station)

- (1) Equipment is well maintained as a whole and there have been no major problems.
- (2) The transformer for Antenna Changer Rack had been burned.
- (3) The following apparatuses for SAR are not broken but not used: DRSC BS (to KANWIL 2GHz), Remote Control Type (VHF), Marine VHF Transmitter, Remote Control Rack.

#### (Transmitting Station)

- (1) The exciter of 1 kW Transmitter is broken and manually operated.
- (2) 1 kW HF Transmitter for SAR is not broken but not used.

#### (KANWIL)

- (1) SAR Console is kept off.
- (2) 400 MHz line to the Receiving Station is off and not used.

#### (ADPEL)

- (1) The room for SAR Console is used as storage and power is off.
- (2) According to the staff, SAR information is sufficiently communicated with TELECOM.
- (3) For communication with vessels, VHF Transceiver (ICOM) is used.

#### CILACAP Area (21 June, 2001)

#### (SROP CILACAP)

- 1. Class: 2nd
- 2. Operation: 16 hours
- 3. Frequencies:

(Mobile)	MF (TP, TG) HF (TP, TG, DSC, NBDP) VHF (TP, DSC)
(Fix)	HF (TP, TG)

4. Personnel:

Chief:	1
Operator:	10 (incl. Administrator)
Technician:	4
Total:	15

5. Remarkable Conditions of Equipment and Facilities

(Receiving/ Transmitting Station)

(1) MF/HF Console

Auto Keyer of NZB-201 Control 1 is broken

- MF Ant. Tuning of NFG-551W, NAF 571 Power Amplifier and NNE-500 Exciter are broken.
- (2) MF/HF Transmitter (500W) is not usable due to crystal trouble.
- (3) MF/HF Transmitter (1kW) is broken.
- (4) VHF Console (50W) is broken.
- (5) MFB Supervising 60 Equipment Type-10 and Remote Monitor Equipment are not usable because MFB of Cilacap is broken.
- (6) Radio Telex Modem is not usable because transmitter is broken.
- (7) E/G(5KVA) is broken.
- (8) 2WT Ant. is cut.
- (9) When receiving distress information, inform to ADPEL, etc. by telephone.

#### (NEW SITE)

DISNAV and SROP Cilacap are planning to separate the Transmitting Station. Survey was made on selected new sites.

(1) Plan A (A1 and neighboring A2)

They are rice paddies including remarkable amount of water and it will cost much to make them fit for building and tower construction. However, radio wave environment is good.

(2) Plan B

- A new access road must be constructed.
- As the site is located in a hill area, to make it fit for SROP will cost much.

- The power and telephone lines must be newly introduced.
- It is located 20 30 km from the shore line and about 20 minutes' drive from Plan A.

#### (DISNAV)

(1) Equipment

Domestic Non-Interrupted Power Equipment and Remote Display Equipment are not usable because MFB is broken.

- (2) DISNAV requested that the equipment of the SROP is actually that for  $3^{rd}$  Class. It should be equipped for  $2^{nd}$  Class.
- (3) DISNAV Ships: Two ships of about 30 years old (50- 60 GT)
- 6. Requests and Comments
- (1) Requests from the SROP
  - The same as above (2) of DISNAV.
  - The Transmitting Station should be separated as early as possible.
  - Many broken apparatuses should be repaired.
- (2) There are two persons (DISNAV 1, SROP 1) who had taken training on MFB. Few others had taken training on com. apparatuses.

#### **BENOA Area (May 19, 2001)**

#### (SROP BENOA)

Administrator

Total:

1. Class:	3rd
2. Operation:	12 hours
3. Frequencies:	
(Mobile)	MF (TP, TG) HF (TP, TG, DSC, NBDP) VHF (TP, DSC)
(Fix)	HF (TP, TG)
4. Personnel:	
Chief:	1
Operator:	25
Technician	

#### 5. Remarkable Conditions of Equipment and Facilities

(1) MF Console (2 MF sets) is broken.

26

- (2) MF/HF Console (2 TX and RX) is broken.
- (3) E/G 2 units: Batteries were not charged.
- (4) Most equipment other than VHF is broken which should be repaired as early as

possible.

(5) Maintenance is not good as a whole.

6. Others.

- (1) When distress information is received at RX, it is sent to ADPEL (HBM).
- (2) DISNAV Benoa is Class 2nd but the SROP is 3rd. Watch-keeping for distress waves is 12 hours. There are Lombok Straits with busy vessel traffic and Denpasar International Airport near the SROP. It should be 1st Class or 2nd Class for 24 hour watch-keeping for distress information.

#### **JAKARTA Area (May 9, 10, 2001)**

#### (SROP JAKARTA)

- 1. Class: 1st
- 2. Operation: 24 hours
- 3. Frequencies:

```
(Mobile) MF (TP, TG) HF (TP, TG, DSC, NBDP) VHF (TP, DSC), NAVTEX(Fix) HP (TP, TG)
```

4. Remarkable Conditions of Equipment and Facilities

(Receiving Station)

- Fix-Com. Console MKP-11 Radio Terminal NRD-93, HF TG Console (NCA-560A) NCH 230 TX Controller and NBDP Console (NCA-784) NRD-93 (1 unit ) are broken.
- (2) E/G 60 KVA: Batteries are broken. Some fuel leakage is seen.
- (3) Ant.: Two lines are cut and kept suspended. A connector is kept off and exposed.
- (4) There are almost no spare parts.
- (Transmitting Station)
- (1) Control System of 5 kW HF Transmitter (JRS-501V) is broken.
- (2) 1 kW HF Transmitter (SAR) (JRS-106NB) cannot be controlled from DGSC.
- (3) Ant. Switching Matrix (ASED-000028) and Ant. Switching Matrix Control are broken.
- (4) Power Distribution Board (NCB-240) is broken.
- (5) 5 kW MF Transmitter (JRS-503E) is broken.
- (6) There are almost no spare parts.
- 5. Problems and Comments
- (1) SROP JAKARTA is the central and most important SROP among others, but many apparatuses are broken at both RX and TX Stations and spare parts are very few. Repair of them and procurement of sufficient spare parts are required as early as

possible.

- (2) The environment for receiving radio waves cannot be said good because the Receiving Station is located inner part from the shore (about an hour by car) and surrounded with residences and industrial facilities which are developing.
- (3) It is necessary for both RX and TX Stations to remarkably improve maintenance system (staff, training, spare parts, etc.).

#### KUPAN Area (May 19, 2001)

#### (SROP KUPAN)

(SNOI NOIM	
1. Class:	2 nd
2. Operation:	24 hours
3. Frequencies:	
(Mobile)	MF (TP, TG) HF (TP, TG, DSC, NBDP) VHF (TP, DSC)
(Fix)	HF (TP, TG)
4. Personnel:	
Chief:	1
Operator and	17
Administrator:	
Technician:	6
Total:	24

#### 5. Remarkable Conditions of Equipment and Facilities

(Receiving Station)

- (1) VHF Controller: 3 of 4 units of VHF Controller are broken.
- (2) E/G: 1 of 2 units (7 KVA) is broken.

(Transmitting Station)

- (1) 3 of 5 units of 1 kW TX, Power Supply Units were burned.
- (2) 1 unit of 1 kW HF TX (JRS-713BM) is broken (Power Supply Unit).
- (3) AMF of 2 units of E/G (40 KVA) are broken.

6. Requests, Comments, etc.

- (1) The Ant. for 400 MHz line between RX and TX is too low. Height of about 100 m is required.
- (2) NAVTEX System should be equipped.
- (3) Distress information is reported to ADPEL.
- (4) Spare parts are left in boxes. They should be kept on racks.

#### JICA PROJECT

Date: November 15, 2001

Appendix 5.2.2. Actual Implementation Schedule for Preparation of Inventory

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NO	NAME	RESP		MA	Y			JUN			JL	UL			AU	G		5	SEP		OC	Т		N	١O٧	1		0	DES			JA	N		F	EB		MA	R
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FINAL	CHECK (DGSC & JICA)																																						
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1	Address and Telephone	E																																					
2	Location	E																																					1
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4	Equipment & Facilities	E		l			-	•																															1
II	DETAILED REPORT																																			-			-
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1	Report	E																			ц.															-			-
2	Cover for Disnav	E																			¢.															-			-
3	Cover for Kanwil	E																			-															-			-
4	Cover for KPLP/ADPEL	E																			-															-			-
5	Cover for SROP	E																			÷,															-			+
2.2	DATA FORMS							_	Fi	inal de	ecision	on fo	rm forr	nat																						-			+
1	Summary of SROP	E							1																											-			1
2	Status of Troubles	E							1																											-			1
2.3	QUESTIONNAIRES											Sta	art to pu	ısh				Start o	on direct dat	a																-			+
1	Preparation	E					Collec	t Disn	av's F	Respo	nse	—Dis	nav				T	collec	tion at Disna	av					L	ea	end									_			1
2	Sending Questionnaires	L	Γ	1				from	DGS	SC	t						E	xtra tii	me							5			Imple	eme	ntatio	a nc	an s	sche	dule				
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2	Equipment List	E							-										777						-1.	••••			an ap	opro	priat	e dra	win	g fo	r ma	ster r	olan		
3	Status of Troubles	E					٦												///						R	evis	ion-2	2:	Revis	sion	and	add	new	/ info	orma	tion I	base	d on	
4	Operation Schedule (Freq)	E					ſ												111					-	-1				site r	espo	onse								$\vdash$
5	Operation Schedule (Opt)	F															1	à	11111		_				-					1					—	<b>—</b>	<b>—</b> —		4
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#### **JICA PROJECT**

Date: November 15, 2001

Appendix 5.2.2. Actual Implementation Schedule for Preparation of Inventory

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NO	NAME	RESP	MAY	JUN	JUL	AUG	SEP		ОСТ	NO\	V		DES		J	AN		FE	в	MAR
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2.5	DRAWINGS																			
2.5.1	TELECOMMUNICATION			Final decis	ion on head draw	ing														
0	Drawing Head	E				All Map colled	ted													
			Collecting	map from			Scanned Map	finished												
			BAKOSURTANAL	or others source			Final plot	ed Map												
1	Site Location	G						11111												
	(est'd. 222 maps)		Redraw fro	om as-built		Bavisian 1														
			drawing or	past data		completed		Fina	al Checked											
2	Antenna Lavout	S				<b>d</b>		<b>V</b> ala												
	(est'd, 239 drawings)		Redraw fr	om as-built		Bavisian 1	Revision	-2												
	(		drawing of	past data		completed	complete	ed Fin	nal Checked											
3	Egpt Floor Layout	S						1////	777											
-	(est'd 257 drawings)			edraw from as-built			Revisio	า-2												
			c	rawing or past data	1	Revision-1 —	complet	ed –												
4	E/G Floor Layout	S			~															
	(est'd 239 drawings)		Redraw fr	om as-built			Revisior	-2												
			drawing o	r past data		Revision-1	complete	ed Fin	al Checked											
5	System Block Diagram	F																		
	(est'd 239 drawings)			Redraw from as-built			Revision	-2												
				drawing or past data	\	Revision-1 completed	complete	ed Fina	I Approval											
6	Power Block Diagram	F						1111	777											
	(est'd 239 drawings)						Revision	-2												
252	SAR			Redraw from as-built	,		complete	ed												
2.0.2	6, (()			drawing or past data	<u>ו</u>	C completed		Final A	nnroval											
1	Antenna Lavout	۹				*	L 7		777											
	(est'd 45 drawings)	0		Rodrow from as built			Revision	2												
				drawing or past data	` <b>+1</b> ────	Revision-1	complete	1 — Fina	al Approval											
2	Eapt Floor Layout	<u>د</u>					<b>. 7</b>	1000	7770											
2	(ost'd 45 drawings)	- 0					Revision	2			~	bnor								<u> </u>
	(est d. 45 drawings)				Revision-1	,	complete	z_ ∃Final	Approval		-eí	jenu	Imple	mont	otion	nlan	ach	adula		
2	E/C Elear Leveut	6			completed	┢────		<u></u>					Imple	ement	ation	pian	SCH	equie		_
3	E/G FIOOI Layout	3				++++++	Revision	2	<u> </u>				Actua	ai imp	lemer	itatio	n			
	(est d. 36 drawings)		F	Redraw from as-built	٦	Revision-1	complete	d				<u>/////</u>	Extra	i time		no hi		drowin	a to b	
4	System Block Disgree						<b>V</b>	hore			cev	ision-1	: Set-U	p resi	uit of a riate d	as-Di rawii	uiit fé na fo	r maet	iy iu bi er nlan	scome
4	System Block Diagram	E						<u>~/////</u>	11/1	<u> </u>			an ap	piopi		1 a vill			or pidit	
	(est a. 45 drawings)				Revi	sion-1	complete	d −Fina	al Approval		(ev	ision-2	: Kevis	sion al		u ne	w Int	ormatio	n base	eu on
	Device Disels Diseases				com	pleted		Jan .			1	- T	Sile I	espon	150	1	<u> </u>		ſ	<b></b>
5	Power Block Diagram							<u>unn</u>	<u>uu</u>							-				$ \qquad \qquad$
	(est a. 45 arawings)						L Revision	-2 comple	eted											

#### Appendix 5.2.3. Specimen of Inventory Documents (Belawan)

THE STUDY FOR MARITIME TRAFFIC SAFETY SYSTEM DEVELOPMENT PLAN IN THE REPUBLIC OF INDONESIA

### Maritime Telecommunication Facilities: Inventory, Plant Records and Outlook-2001

1ST CLASS COAST STATION BELAWAN (COAST STATION No. 10)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

November 2001

			TION			SIT	E	BEI	AWAN	1		
SUMIMARI	Y OF COASI	SIA	HON			CL	ASS		1st	NO.		10
1. LOCATION	I											
Station	Address		Tel.		F	ax	I	ongit	ude	Ι	atitu	ıde
RX Jl. Bagan D	eli, Belawan		6941203		694	1474	98°	41'	52″ E	03°	46'	50" N
TX Jl. Titi Pal	hlawan, Labuhan Deli		685151				98°	40'	08″ E	03°	43'	17″ N
2 GENERAL	CONDITIONS											
2. OENERAL	from Jakarta	Site Ac	cess from P	ort	Road	l Troffi	c	Acco	mmodat	ion	Ponu	lation
By Air to Medan	Taking time: 2:00 h	r 1 🗹 Hio	hway		Teavy	, 11a111	ic .	M Ho	tel		7.00	10 000
By Car to Belawan	[Taking time: 0:48 h	$r_1 \square Pav_1$	ed		Mediu	ım		$\square$ Mc	otel		7,00	,000
Dy cur to Doluwun	<u>. []</u>	$\Box$ Unn	aved road	۱ ک ا	jeht							
		r		۱ 🗆	None							
3.0	ONDITIONS OF	PECE	IVINC S	гаті	ON				Refer	to attac	ched	drawing
J. C 3 1 Site Conditi	ong	NECE		IAII					iterer	io utiu	mea	araming
5.1 Site Colluit	IOIIS Noture	ofSoil		Dog	t dico	stor of s	ito	Con	firmation	. of ovi	eting	sustam
Topograpny		01 S011	aastana		a uisa	ster of s	ne	Ves	No	I OI EXI	sung	system
□ Flat	Dry soll		val		od Ti	ida		<b>I</b> C3		tonno		
$\square$ Hill-top			aky		in Le	akage		N		wers (N	Aaste	2)
□ IIII-top □ Basin	$\Box$ Clay		ску	□ Ka Ø Gr	ound	anage Subside	ence	N	$\Box$ $Gr$	undin	o svs	tem
$\square$ Valley	$\square$ Sandy				ound	Subside	lice	N		htning	<u>- sys</u> svet	em
Altitude	3.00	м		Те	lenho	ne Lin	es		$\Box$ Fee	der Ca	ble V	Vav
Land area	21,750	m ²		I I I I	3	Lines	3	V	$\Box$ Cit	v water	r	, uj
3 2 Ruildin	g Conditions			l	33	Power	r Soi	irce	0.0	,		
5.2 Dullull	tructions		PI N Sou	rco	5.5	F/G	500	Fri	sting P	wer (	'ond	itions
Num of story	One	Voltage	380	V		380	V	Good	Bad		Jonu	nions
Structure	Concrete	Phase	500	3		500	3	M		er Sur	nlv §	System
Type of roof	Zinc	Wire		4			4	<u> </u>	$\Box$ Ope	rations	of F	E/G
Type of ceiling	Asbestos	kVA		-		4	55		☑ Ope	rations	of A	VR
Type of wall	Brick		Ouality o	of PLN	sour	ce		Ca	pacity o	f fuel	for e	ngine
Wall finish	Painting	Fluctuati	ons	220	V ±	10 %		Dav ta	ank		40 ]	Liter
Flooring	Tile	Availabi	lity of powe	r per d	av	24 H	Iours	Main	tank		7.5 ]	k Liter
Room A	Area (m²)	Power in	terruption /1	month		17 T	imes	]	E/G Sta	nd-bv	Syst	em
Operation room	154.00	Total int	erpt. hours /	month		65 H	ours		Single	Syster	n	
E / G room	21.00	Max. inte	erpt. hours a	at once		18 H	ours	$\checkmark$	Dual S	ystem		
Remark										2		
Error! Not a vali	id filename.											
5. OP	ERATION AND	MAINT	ENANCI	Ŧ,		6. PI	ERS	ONN	EL FO	)RM	ATI	ONS
	Actions taken in equi	pment fa	ilure			0111		0111		RX SX	T	TX
Restoration flow	Repaired by himsel	f				Chief				1	1	
Examples of major failu	re Lightning and Pow	er (PLN)	disturbance			Operat	or (sk	cilled)	14	4 (12)		0
Sufficiency of spares	Not enough	maaanbaaanaaanfaa	MARAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA			Techni	ician (	skille	d)	2 (2)	İ	14 (2)
Record	ls of damages	Envi	ronmental	Condi	tions	Admin	istrat	or		6		
□ Heavy rainfall		Good	Bad									
□ Storm			Externa	al noise	es	Tota	1			35		14
☑ Lightning	Tower (55M & 65M)		□ Air pol	llution					ļ		ļ	
$\Box$ Other calamity												
	Institutional and Hu	man Stat	uses			G		Trai	ning Re	cord	· .	<b>—</b> •
1 Budget		$t \square Rea$	sonable ⊻	Insuffi	cient	Cour	se	Class	Loca	tion Pe	riod	Trainee
2 Spares	レ Enough		sonable   ☑	Not en	ough	Pre		1/11	Jakar	ta		6 15
3 Measuring eqpt.	rotor D Enough		sonable $\Box$	Not en	ough	оги тр		11	Jakar	ld ta		15
5 Number of Tech	aioi 🗆 Enough		sonable $\square$	Not on	ough	11 Operato	r I	 	Jakar	ta		21
6 Canability of On	perator	✓ Not	so had	Not cer	nahle	operato	·	Ju	рака	<u>u</u>		<u>ل</u> کے
7 Capability of Te	chnician $\Box$ Skilled	I Not	so bad	Not ca	nable							
						TD •		7 <b>D</b> 4	TA	<u> </u>		
1	7. SIAHSHQ	LAL CU	JIVIIVIUNI	ILAI.	IUN	IKA	r F I (	JDA	IA			

CULU	ADV	OF C	<u>о л ст</u>		ΓΙΟΝ	r		SITE	BEL	AWAN						
SUMIN	ΙΑΚΙ	OrC	UASI	SIA				CLASS	5	1st	NO.	10				
	Mar	itime Sa	fety		Public Telecommunication Service											
						Tele	phone	TG		Telej	TG					
Years	TG	TEL	DSC	NBDP	Years		-	Call	Years		-	Call				
						Call	Minute			Call	Minute					
1996	16				1991	666	3,761	3,688	1996	753	3,683	2,05				
1997	37				1992	668	4,033	3,271	1997	423	2,467	1,501				
1998	38				1993	618	3,631	2,982	1998	332	1,581	1,109				
1999	29				1994	879	5,506	2,487	1999	420	1,844	812				
2000	16				1995	727	3,874	2,379	2000	249	1,257	880				
				8.	COM	MEN	ГS									
	In RX St	E/G 110V	1 Phase 10	kVA need	to be char	nged by	a bigger as	35 kVA	3 Phase 2	20V with	automatic					
Suggestion	operation															
Suggestion	For main	tenance pur	poses we n	eed handy t	alky											
	And also	motor Cyc	le for maint	tenance of r	adio equip	oment w	ithin Sarco	m Area-I	Medan-B	elawan						
Remarks																

BLW-010- (1 / 14)

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INVENTORY

			_						
No	Registered No.	Description	Type	Serial No	Manufacturer	Date	Reference	Record	Condition
1		Radio Equipment							
1-1		Transmitter							
1		1 kW MF Mobile Transmitter	JRS-713AM	JF-00032	JRC	1997	F-TA-193: PH2		PS damage
2		1 kW HF DSC Transmitter	JRS-713AM	BS-63489	JRC	1995	F-TA-193: PH3		Good
б		1 kW HF NBDP Transmitter	JRS-713AM	BS-63490	JRC	1995	F-TA-193: PH3		PS damage
4		1 kW HF FIX COM Transmitter	JRS-713BM	BS-63520	JRC	1995	F-TA-193: PH3		Good
5		1kW HF Transmitter	JRS-106 NB	BS-62076	JRC	1990	SAR Project		Exc damage
9		1kW HF Transmitter	JRS-106 NB	BS-62077	JRC	1990	SAR Project		Good
7		1kW HF Transmitter	JRS-106 NB	BS-62103	JRC	1989	F-TA-193: PH2		Good
8		1kW HF Transmitter	JRS-106 NB	BS-62112	JRC	1989	F-TA-193: PH2		Good
6		1kW MF/HF Transmitter	JRS-106 NB	BS-62102	JRC	1989	F-TA-193: PH2		Good
10		1kW MF Transmitter	JRS-108 P	BS-62119	JRC	1989	F-TA-193: PH2		Good
11		1kW MF Transmitter	JRS-108 P	BS-62002	JRC	1987	F-TA-193: PH1		PS damage
12		1kW HF Transmitter	JRS-106 NB	BS-61397	JRC	1987	F-TA-193: PH1		Good
13		1kW MF/HF TP Transmitter	8RZ-153	CC-1700/S1	Philips	1969			Damage
14		1kW HF TP Transmitter	8RZ-153	CC-1700/S2	Philips	1969			Damage
15		1kW MF TG Transmitter	8RZ-159	S1	Philips	1969			Damage
16		1kW MF TG Transmitter	8RZ-159	S2	Philips	1969			Damage
17		1kW MF TP Transmitter	8RZ-159	S3	Philips	1969			Damage
18		1kW TP Transmitter	8RZ-153	S2	Philips	1969			Damage
19		1kW FIX SSB Transmitter	8RZ-813/1		Philips	1969			Damage
20		1kW FIX ISB Transmitter	8RZ-153/1		Philips	1969			Damage
21		100W SSB Transceiver	NS-11A	5320042	Furuno	1978			Damage
22		100W SSB Transceiver	SR-206		Philips				Damage
1-2		<b>Remote Control System</b>							
1		Multiplex Radio	JUP-450	EM-11505	JRC	1985	F-TA-193: PH1		Good
2		Multiplex Radio	JUP-450	EM-11506	JRC	1985	F-TA-193: PH1		Good
Э		Multiplex Radio	JUP-450	EM-11507	JRC	1985	F-TA-193: PH1		Good
4		Multiplex Radio	JUP-450	EM-11508	JRC	1985	F-TA-193: PH1		Good
5		Multiplex Terminal	JUF-5A	EP-11842	JRC	1985	F-TA-193: PH1		Good
9		Multiplex Terminal	JUF-5A	EP-11843	JRC	1985	F-TA-193: PH1		Good
7		UHF Link	8SR-860	407	Philips	1969			Damage

## BLW-010- (3 / 14)

Site Nama: Belawan

INVENTORY

								Maintenance	
No	Registered No.	Description	Type	Serial No	Manufacturer	Date	Reference	Record	Condition
10		500 kHz AA Buzzer	BZ-18	BA-20743	JRC	1985	F-TA-193: PH1		Good
11		Power Unit	NBA-3579	BP-20743	JRC	1985	F-TA-193: PH1		Good
12		Power Supply	NBA-1180	MF-12475	JRC	1985	F-TA-193: PH1		Good
13		Audio Select and Monitor	NCJ-280 B	BP-89376	JRC	1985	F-TA-193: PH1		Good
14		Tape Recorder	X-2000 R	50603	TEAC	1985	F-TA-193: PH1		Good
1-3-2		MF TP Console	NCA-822A	JF-31756	JRC	1997	F-TA-193: PH3		Good
1		Telephone Repeater	NQQ-31B	JF-31877	JRC	1997	F-TA-193: PH3		Good
7		Signal Controller	NQP-21	JF-31869	JRC	1997	F-TA-193: PH3		Good
3		Telecontroller	NCH-701	JF-31956	JRC	1997	F-TA-193: PH3		Good
4		Telecontroller	NCH-300P	BP-90907	JRC	1987	F-TA-193: PH2		Good
5		Receiver	NRD-93	BR-33369	JRC	1985	F-TA-193: PH1		Good
9		Receiver	NRD-93	BR-33371	JRC	1985	F-TA-193: PH1		Good
7		Scanning Unit	NDH-93	BR-35451	JRC	1985	F-TA-193: PH1		Good
8		Tx Selector	NCJ-676	JF-32057	JRC	1997	F-TA-193: PH3		Good
6		Speaker Panel	NVA-64-2		JRC	1997	F-TA-193: PH3		Good
10		Power Supply	NBK-31B		JRC	1985	F-TA-193: PH1		Good
11		Junction Box	NQD-3760		JRC	1997	F-TA-193: PH3		Good
12		Jack Panel	NQC-742A		JRC	1997	F-TA-193: PH3		Good
13		RF Panel	NQE-584C		JRC	1997	F-TA-193: PH3		Good
14		Clock (+7H)	6HCED00073		JRC	1997	F-TA-193: PH3		Good
1_3_3		HF TC/NRDP/TP Consolo							
2		Console	NCA-821A	JF31762	JRC	1997	F-TA-193; PH3		Good
7		Receiver	NRD-93	BR33372	JRC	1985	F-TA-193: PH3		Good
3		Receiver	NRD-93	BR41466	JRC	1985	F-TA-193: PH3		Good
4		Scanning Unit	NDH-93	BR35452	JRC	1985	F-TA-193: PH3		Good
5		Scanning Unit	NDH-93	BR35453	JRC	1985	F-TA-193: PH3		Good
9		Speaker Panel	NVA-64-2	BP-23741	JRC	1985	F-TA-193: PH3		Good
7		Speaker Panel	NVA-64-2	BP-23740	JRC	1985	F-TA-193: PH3		Good
8		Signal Controller	NQP-21-1	JF31869	JRC	1997	F-TA-193: PH3		Good
6		Signal Controller	NQP-21-1	JF31870	JRC	1997	F-TA-193: PH3		Good
10		Telephone Repeater	NQQ-31BB	JF31888	JRC	1997	F-TA-193: PH3		Good

Site Name: Belawan

# OPERATION SCHEDULE (FREQUENCIES)

Mobile Service : PKB	
Call Sign :	

		,																									 
		KEIVIAKK																									
		21 22 23 24																									
		5 16 17 18 19 20 1 1 1 1 1 1																· · · · · · · · · · · · · · · · · · ·									
	UTC	1 11 12 13 14 15 1 1 1 1 1																									
		06 07 08 09 10 1 1 1 1 1																									
		01 02 03 04 05																									
: 8AI	POWER	(M)		1000	1000	1000	1000	1000	1000	1000	1000	1000		1000	1000	1000	1000	1000	1000		1000	1000	1000	1000	1000	1000	
<b>FIX Service</b>		EMISSION		A1A	A1A	A1A	A1A	A1A	J3E	J3E	J3E	J3E		F1B	F1B	F1B	F1B	F1B	F1B		F1B	F1B	F1B	F1B	F1B	F1B	
	FREQUENCY	(kHz)	Mobile Service	500.0 - 474.0	4,295.0	8,686.0	12,970.5	17,239.7	3, 2,182 - 3,180	6,215 - 6,510	8,746.0	13,077.0	DSC Service	0 2,187.5	1 4,207.5	6,312.0	3 8,414.5	4 12,577.0	5 16,804.5	NBDP Service	6 2,174.5	7 4,177.5	6,268.0	9 12,520.0	0 16,695.0	1 8376.5	
				-	^{CN}	(7)	4	L)	Ś	1	ω	S CO		÷	~	-	τ,	÷	Ť		÷	-	-	i ÷	Ñ	2	



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Appendix 5-2-3-7











: AJIL Y8 GEVORIGA : 8AA Y8 MWAAG



Appendix 5-2-3-13

#### Appendix 6.1.1. Summary of Measurement of Accuracy of GPS per day (24hours) (Static Accuracy)

Measured	No.1 GPS R	leceiver	No.2 GPS R	eceiver	No.3 GPS R	leceiver	No.4 GPS R	eceiver	No.5 GPS R	eceiver
Date	Nos. of data	Error (m)								
06-May-01	8613	14.5	8608	9.4	8615	11.6	86032	8.4	43062	9.1
07-May-01	8636	14.3	8637	10.1	8641	12.3	85767	9.3	43190	9.8
08-May-01	8637	11.1	8635	8.0	8641	11.8	86128	9.2	43194	9.5
09-May-01	8640	13.7	8640	7.7	8641	9.8	85852	5.7	43196	7.5
10-May-01	8638	15.2	8632	12.0	8641	14.8	85458	11.0	39558	11.4
11-May-01	8639	17.8	8640	10.7	8638	15.0	82631	10.3	43188	11.1
12-May-01	8508	12.0	8507	7.7	8516	8.6	85075	5.5	42610	7.0
13-May-01	8635	12.0	8638	8.2	8641	10.7	86325	7.7	43916	8.5
14-May-01	8630	12.7	8638	9.0	8641	13.4	86022	9.1	43196	9.9
15-May-01	8638	12.8	8638	8.1	8641	12.7	86359	7.4	43194	8.0
16-May-01	8640	13.7	8640	9.4	8641	13.9	86121	9.4	43201	9.8
17-May-01	3930	13.5	3933	9.5	3932	14.7	39335	10.7	19665	10.5
18-May-01	7280	12.8	7417	9.0	7415	12.8	72091	8.4	36157	9.9
19-May-01	8640	12.8	8634	9.1	8641	13.4	86385	9.1	43195	9.8
20-May-01	8638	12.8	8623	8.3	8641	11.5	86104	8.0	43189	8.6
21-May-01	8639	13.6	8312	8.3	8641	13.4	86269	8.9	43184	9.6
22-May-01	8639	12.4	8638	9.2	8641	12.3	86290	9.3	43192	10.1
23-May-01	8639	13.4	8635	8.3	8641	10.7	86043	6.8	43194	8.2
24-May-01	8625	12.4	8624	7.4	8627	11.7	79198	7.7	43129	8.5
25-May-01	7640	13.7	8594	7.7	8593	10.5	63546	7.0	42931	8.1
26-May-01	8638	12.8	8634	8.1	8641	12.4	86387	9.6	43195	10.7
27-May-01	8638	13.9	8635	9.5	8641	15.5	86395	11.3	43139	11.4
28-May-01	7667	11.9	7750	6.8	7752	12.0	64498	8.5	38696	9.4
29-May-01	8414	12.3	8406	8.1	8408	12.5	82114	8.3	41982	9.1
30-May-01	4788	13.7	4767	8.3	4754	11.7	35770	7.9	23662	9.3
31-May-01										
01-Jun-01	8606	12.7	8605	8.5	8602	12.2	85907	9.0	42123	9.9
02-Jun-01	8616	13.4	8639	8.1	8641	12.5	86393	7.4	43191	9.3
03-Jun-01	8637	12.1	8640	6.6	8641	10.9	86209	7.4	43191	8.1
04-Jun-01	8639	13.2	8640	7.8	8641	10.5	86337	7.1	43193	9.1
05-Jun-01	8640	11.5	8639	6.7	8641	8.9	86384	5.7	43195	7.8
06-Jun-01	8639	13.1	8635	7.4	8641	11.8	85957	8.5	43188	9.6
07-Jun-01	8637	14.1	8638	9.7	8641	11.8	86389	9.4	43196	9.8
08-Jun-01	8638	12.5	8636	7.5	8641	10.1	86027	7.0	43194	8.2
09-Jun-01	8639	12.5	8640	8.2	8641	9.8	86187	7.1	43192	7.9
10-Jun-01	8638	12.8	8639	8.0	8641	9.9	86390	6.8	43193	7.9
11-Jun-01	8640	14.1	8641	10.8	8641	10.8	86388	7.7	43193	8.9
12-Jun-01	8625	12.4	8626	6.4	8627	10.6	86236	6.6	28726	8.1
13-Jun-01	8640	12.5	8638	7.9	8641	12.1	86220	9.4	14397	9.9
14-Jun-01	8639	13.5	8639	8.1	8641	12.4	86356	8.5	43196	9.6
15-Jun-01	8622	14.2	8622	7.3	8623	10.7	86209	7.8	43104	8.3
16-Jun-01	8485	13.8	8483	8.5	8490	12.1	84915	8.8	42467	8.1
17-Jun-01	8636	14.9	8639	7.9	8537	13.0	86361	9.7	40105	9.8
18-Jun-01	8638	13.7	7983	7.7	7988	11.5	79910	8.1	39978	9.4
19-Jun-01	8620	11.9	8178	7.7	8175	10.5	81724	7.5	40850	9.1
20-Jun-01	8640	12.5	8640	8.3	8641	10.9	79184	7.9	28799	9.7
21-Jun-01	8639	13.6	8636	8.5	8641	11.6	86393	8.1	14395	8.0
22-Jun-01	8640	13.0	8639	7.3	8641	12.1	85906	8.6	28799	10.0
23-Jun-01	8639	14.3	8633	8.9	8641	14.5	86216	10.3	14395	8.0
24-Jun-01	8630	14.0	8636	8.5	8641	13.3	86393	10.1	43191	11.1
25-Jun-01	8636	12.8	8638	8.2	8641	10.8	86390	8.7	43187	10.2
26-Jun-01	8640	13.5	8637	7.2	8641	10.8	86385	7.5	43188	9.1
27-Jun-01	8639	13.2	8637	7.5	8641	11.1	85522	8.1	43192	9.5
28-Jun-01	8639	15.1	8639	8.5	8641	13.2	86351	9.2	43188	9.7
29-Jun-01	8640	12.2	8258	7.4	8641	10.8	86394	7.6	43189	9.7
30-Jun-01	5754	12.7	5759	8.6	5041	13.2	50394	8.3	28787	11.4
# Appendix 6.1.1. Summary of Measurement of Accuracy of GPS per day (24hours) (Static Accuracy)

Measured	No.1 GPS R	leceiver	No.2 GPS R	leceiver	No.3 GPS R	leceiver	No.4 GPS R	leceiver	No.5 GPS F	Receiver
Date	Nos. of data	Error (m)	Nos. of data	Error (m)	Nos. of data	Error (m)	Nos. of data	Error (m)	Nos. of data	Error (m)
20-Oct-01										
21-Oct-01	8638	14.2	8638	10.6	86400	10.8	86389	7.4	42288	8.8
22-Oct-01	8613	12.7	8612	9.2	17299	13.5	85994	10.1	42375	11.3
23-Oct-01	8639	16.6	8640	13.3	8641	16.2	86394	11.8	42567	13.4
24-Oct-01	7896	12.6	7891	10.4	7885	10.9	86384	8.5	38054	9.5
25-Oct-01	8639	17.2	8640	14.6	8641	15.7	86394	15.5	40784	16.8
26-Oct-01	8640	15.5	8639	14.8	8641	10.5	86366	10.6	43196	12.9
27-Oct-01	8509	15.6	8507	14.3	8510	11.0	84713	10.6	42539	11.8
28-Oct-01	8640	13.0	8638	8.7	8641	8.6	86355	5.4	43196	7.5
29-Oct-01	8639	14.2	8640	9.3	8641	16.0	86314	12.0	43199	13.8
30-Oct-01	8640	14.0	8636	7.3	8641	12.0	86372	7.5	43195	9.2
31-Oct-01	8564	14.2	8559	11.5	8555	10.5	85458	7.4	42710	8.9
01-Nov-01	8638	12.6	8638	7.4	8641	10.4	86231	6.4	43198	8.5
02-Nov-01	8639	12.0	8639	8.6	8641	10.9	86318	7.6	43197	9.3
03-Nov-01	8639	14.9	8639	12.3	8641	10.0	86174	8.4	43196	9.4
04-IN0V-01	8031	10.3	8038	13.7	8041	10.8	80308	8.5	43198	10.5
05-Nov-01	7010	10.2	8624	7.5	0041 9641	9.9	00392 86210	2.4	43194	0.7
07-Nov-01	8637	10.1	8630	7.5	86/1	11.0	86366	0.2	43191	8 7
07-Nov-01	8640	14.5	8629	13.7	86/1	10.4	85990	8.8	43137	10.7
09-Nov-01	8640	14.5	8639	13.7	8641	10.4	86392	9.0	43197	10.7
10-Nov-01	8633	12.9	8638	11.7	8641	10.3	86026	7.2	43198	8.0
11-Nov-01	8603	9.5	8512	6.1	8514	10.7	85103	5.5	42539	7.5
12-Nov-01	8640	18.0	8639	17.9	8641	14.8	86348	13.8	43194	16.1
13-Nov-01	7711	13.2	7711	10.2	7720	10.4	76791	7.9	39610	8.6
14-Nov-01	8603	12.5	8604	10.7	8561	10.7	84852	6.0	43047	8.6
15-Nov-01	8550	14.8	8524	8.5	8535	10.5	89297	5.6	42667	6.9
16-Nov-01	8640	12.8	8637	7.9	8641	9.0	86322	5.7	43198	7.2
17-Nov-01	8640	13.4	8638	8.4	8641	9.9	86388	5.0	43195	6.5
18-Nov-01	8640	11.8	8639	9.8	8641	10.1	86392	7.9	43199	7.8
19-Nov-01	8602	11.6	8604	6.7	8607	10.3	79163	6.3	43199	7.7
20-Nov-01	8575	15.9	8575	8.9	8583	14.0	77835	9.6	42934	10.3
10 Dec 01	5264	67	5262	6.0	5260	6 1	52542	1.0	26770	6.2
19-Dec-01	7002	8.0	7006	0.9 8 0	8001	0.1 & 1	86282	1.9	43200	73
21-Dec-01	8606	8.9	8640	0.3 Q /	86/1	6.5	86084	4.3	43200	7.5
22-Dec-01	8641	6.6	8640	7.3	8641	8.7	86393	4.4	43200	8.0
23-Dec-01	8593	5.4	8589	6.2	8589	5.9	85835	3.5	42927	5.2
24-Dec-01	8641	5.4	8640	5.8	8641	6.3	86306	5.3	43200	5.7
25-Dec-01	8641	6.8	8640	7.3	8641	9.3	86241	4.4	43199	8.3
26-Dec-01	8641	4.9	8639	5.5	8641	7.2	86006	5.6	43196	6.1
27-Dec-01	8005	4.3	8592	4.9	8592	7.4	85683	3.8	42946	6.7
28-Dec-01	8441	6.9	8439	6.9	8441	6.7	84361	3.8	42200	5.9
29-Dec-01	8641	6.3	8640	6.7	8641	5.5	86306	2.4	43200	5.4
30-Dec-01	8640	10.0	8640	9.9	8641	7.1	86363	3.4	43198	7.6
31-Dec-01	8640	6.8	8639	7.2	8641	10.8	86328	4.4	43200	9.9
01-Jan-02	8640	5.4	8640	5.5	8641	7.3	86379	3.4	43200	6.3
02-Jan-02	8578	7.0	8580	7.1	8582	7.4	78745	4.0	42408	7.7
03-Jan-02	8640	6.2	8640	7.0	8641	6.0	82731	1.9	41503	4.8
04-Jan-02	8640	6.0	8639	6.3	8641	6.6	86340	3.7	43200	4.9
05-Jan-02	8640	7.5	8638	8.1	8641	6.9	86315	5.4	43200	6.6
06-Jan-02	8610	7.5	8610	7.5	8611	6.5	85911	2.3	43049	7.1
07-Jan-02	8607	7.6	8604	8.3	8607	6.7	86004	3.7	43033	6.1
08-Jan-02	7616	6.1	8615	6.8	8616	5.9	85057	2.7	43079	4.8
09-Jan-02	8588	7.7	8586	7.8	8586	8.6	85769	3.9	42916	8.0



























No.1 GPS Receiver (May 31 2001 – June 30 2001)



No.2 GPS Receiver (May 31 2001 – June 30 2001)



No.3 GPS Receiver (May 31 2001 – June 30 2001)



No.4 GPS Receiver (May 31 2001 – June 30 2001)





No.5 GPS Receiver (May 31 2001 – June 30 2001)



No.1 GPS Receiver (Oct. 20 2001 – Nov. 21 2001)



No.2 GPS Receiver (Oct. 20 2001 – Nov. 21 2001)

Cumulative Model of GPS Receiver No. 3 Receiver Period of Analysis 2001/10/20 03:18:31 To 2001/11/21 01:52:10 probability curve. Speed 0km/h Data Number 426851 Std Deviation x2(m) 11.2 With MSA's Statistic Style Error is 11.2m by 95% % 100 cumulative 95 probability.. 90 80 70 60 50 40 30 20 10 9 10 11 12 13 14 15 16 17 18 19 20 0 4 5 6 7 8 1 2 3 meters E Traceiner Feederal Annahus 2003 (0.2018) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) Multiple Card Receiver 
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 Media/Links Sole
 Model of GPS Receiver tent on t forest than to Error Plotting in meters Error Histogram in meters 1 16 17 18 16 28 meters

No.3 GPS Receiver (Oct. 20 2001 – Nov. 21 2001)

Cumulative Model of GPS Receiver No. 4 Receiver Period of Analysis 2001/10/20 03:18:48 To 2001/11/20 22:15:01 probability curve. Speed 0km/h Data Number 2683494 Std Deviation x2(m) 9.1 With MSA's Statistic Style Error is 9.1m by 95% 100 cumulative 95 probability.. 90 80 70 60 50 40 30 20 10 10 11 12 13 14 15 16 17 18 19 20 meters 0 4 5 6 7 8 9 2 3 Here Dec & Receiver Partiel of Analysis 2001116/2015111648 To 2001117/2012/2013 Dec Analysis (2001116/2012/2013) Ball Wein MEA's Darketic Decis Robel of CPUS PA ...... Speed Black 807.118480 MeenLaw 1845 i 1945az Kolfsenleri T Total Politacian [ Error Histogram in meters Error Plotting in meters -8 17 18 19 20 meters

No.4 GPS Receiver (Oct. 20 2001 - Nov. 21 2001)

No.5 GPS Receiver (Oct. 21 2001 - Nov. 21 2002)



No.1 GPS Receiver (Dec. 19 2001 - Jan. 10 2001)



No.2 GPS Receiver (Dec. 19 2001 - Jan. 10 2001)



No.3 GPS Receiver (Dec. 19 2001 - Jan. 10 2001)



No.4 GPS Receiver (Dec. 19 2001 - Jan. 10 2001)





No.5 GPS Receiver (Dec. 19 2001 – Jan. 10 2001)

# Questionnaire on GPS Needs

Daftar pertanyaan untuk Survey kebutuhan GPS sistim Jica Study Team (JANA)

## The objectives of the questionnaire

This questionnaire is intend to grasp a demand of personnel engaged in shipping service activities for the Aids to Navigation, and reflect it to the development plan on the Maritime Traffic Safety System for Indonesia. Survey of this time particularly put a main point on the demand for GPS and DGPS.

#### Tujuan Survey

Daftar pertanyaan berikut ini dimaksudkan untuk mendapatkan jumlah kebutuhan personil yang berhubungan dengan kegiatan pelayaran dalam hubungannya dengan alat bantu Navigasi dan merefleksikannya kedalam rencana pengembangan sistim keselamatan pelayaran di Indonesia. Survey saat ini menitik beratkan study pada kebutuhan peralatan GPS (Global Positioning System) dan DGPS (Differensial Global Positioning System)

#### The entry point

Please enter the underlined place and [ X ] mark on the circled number of applicable answer.

Silahkan isi jawaban anda pada kolom kosong dengan garis bawah atau memberikan tanda silang pada jawaban yang anda pilih

 X

 Example/Contoh
 (1) A
 (2) B
 (3) C
 (4) D

1. Name of your ship ______ Nama Kapal anda

2. How many crew are on board?

Berapa personil/crew yang bekerja dikapal?

(1) 1-5 (2) 5 - 10 (3) 10 - 15 (4) 15 - 20

- (5) 20 25 (6) 25 30 (7) more than/*lebih dari 30* (_____)
- 3. Is your ship engage on international voyage?

#### Apakah kapal anda melakukan pelayaran international ?

- (1) Yes/ya (2) No/tidak
- 4. Type of Ship

Jenis Kapal

(1) Tanker	(2) Ore Carrier	(3) Coal Carrier
Tanker	Pengangkut Biji besi	Pengangkut Batubara
(4) Container Carrier	· (5) Cargo Ship	(6) Passenger Vessel
Kapal Container	Kapal barang	Kapal penumpang
(7) Fishing Boat	(8) Barge	(9) Tugboat
Kapal untuk mano	ing Barge	Kapal penarik
(10)Pilot Boat	(11) Dredger	(12) Official Ship
Kapal pemandu	Kapal keruk	Kapal pemerintah
(13) others/Lain-lain		

5. Gross Tonnage of your Ship

Berat keseluruhan Kapal anda

(1) 0 - 150 (2) 150 - 300 (3) 300 - 500 (4) 500 - 3000

- (5) 3.000 10.000 (6) 10.000 50.000
- (7) more than/*lebih dari 50.000*
- 6. Does your ship sail at night?

# Apakah Kapal anda berlayar diwaktu malam hari?

(1) yes/ya (2) no/tidak

7. Name of the ports you often use

Nama Pelabuhan yang sering anda kunjungi (Not limited to one port)/(tidak terbatas pada satu pelabuhan)

 Domestic Port/Pelabuhan Dalam negeri

 Foreign Port/Pelabuhan International

8. Where is your main usual navigation route in Indonesia? Dimana jalur utama anda berlayar di Indonesia

Name of the Route/Nama jalur _____

9. How many times have your ship passed through following Straits or Sea lanes in a year?

Berapa kali Kapal anda melintasi beberapa selat sebagai berikut dalam satu tahun?



10. If you have ever experienced the difficulty to navigate due to poor visibility, enter the location and duration in table below.

Bila anda pernah mengalami kesulitan untuk berlayar karena terbatasnya jarak pandang, sebutkan lokasi dan lamanya pada tabel berikut ini.

Location(sea-area)	Hours of duration

11. By what means do you get the information about the weather condition and so on others before the departure from a port. (Several answers are possible)

Bagaimana anda mendapatkan informasi mengenai keadaan cuaca dan kondisi lainnya sebelum berangkat dari pelabuhan. (beberapa jawaban diperbolehkan)

(1) TV	(2) Public Telephone	(3) Portable-phone	(4) Internet			
Televisi	Telepon umum	Telepon genggam	Internet			
(5) FAX	(6) Radio	(7) Newspaper				
Facimile	Radio	Surat kabar				
(8)Others/sumber lainnya						

12. Have you ever experienced or encountered the sea disaster? If you have, please enter the location and its cause.

Pernahkah anda mengalami bencana/kecelakaan dilautan disebabkan cuaca ? Jika pernah sebutkan lokasi dan penyebabnya.

1.Name of the Area_	
Nama lokasinya	
2.Cause	
Penyebabnya	

13. What kind of electronic apparatus does your ship have on board? Peralatan komunikasi Elektronik jenis apa yang ada dikapal anda ? (Several answers are possible)(Beberapa jawaban diperbolehkan) (1) Loran C Receiver (2) GPS Receiver (2) Radar (X band()S band()) (4) Radio Direction Finder (5) VHF Radio Telephony (6) Maritime Mobile Radiotelephone (7) Portable Phone (8) FAX (9) Telex (10) ECDIS : Electronic Chart Display and Information System (11) others/lainnya

If you marked the (2) **GPS** Receiver above, please answer the question 14. *Jika anda memberi tanda pada kolom*(2) **GPS** *receiver diatas, mohon dijawab pertanyaan nomer 14* 

14.That Receiver is /alat penerimanya adalah :

- I. (1) GPS Receiver without any accessory Penerima GPS dengan peralatan tambahan
  (2) GPS Receiver with any accessories Penerima GPS tanpa peralatan tambahan
  (3) GPS Receiver being able to receive DGPS signal Penerima GPS yang mampu menerima sinyal DGPS
- II. Made by the manufacturer in/dibuat oleh Pabrik di

(1) Indonesia	(2) Netherlands (3) Fi	cance (4)U.K	ζ.			
Indonesia	Belanda	Perancis	Inggris			
(5) Japan	(6) U.S.A	(7) Germany				
Jepang	Amerika	Jerman				
(8) others (name of the nationality)						

Produksi negara lain diluar yang disebutkan diatas

#### 15. Have you ever experienced to utilize DGPS?

Apakah anda pernah mempunyai pengalaman dalam penggunaan DGPS?(1) yes/ya(2)no/tidak

16. If you answered (1) y es in question 15. Above, please answer about the following question.

Jika jawaban anda adalah (1) ya dalam pertanyaan No.15 diatas. Mohon dapat dijawab pertanyaan sebagai berikut.

Where is the usefulness of DGPS according to your experience? Dimanakah penggunaan DGPS yang paling optimum menurut pengalaman anda.

- (1) Congested waters/Perairan yang padat
- (2) Port/ Harbor area or approaching to the navigational route of harbor./Pelabuhan atau area sekitar jalur pelayaran dipelabuhan
- (3) Narrow channel waters/Jalur pelayaran yang sempit
- (4) Fishing operation waters/Perairan tempat pemancingan
- (5) Other waters/lokasi lainnya _____

For the person who answered (2) No in question 15 above. Untuk anda yang menjawab (2) tidak pada pertanyaan no.15 diatas.

DGPS, using the frequency band of maritime radio beacon, is supplement system of GPS. And it is a system enhancing accuracy of the GPS into less than 10m, and also broadcasting warning information such as unscheduled outage.

DGPS is based on international standards and be able to utilize it in major shipping bureau coast.

The revision of SOLAS V request to ships to carry Automatic Identification System(AIS) equipment on and after 1 July 2002, according to the type and size of the ship.

AIS will report ship's position periodically during the navigation. The accuracy of position fixing is very important. So, it is desirable to use DGPS.

Differensial Global Positioning System atau yang biasa disebut dengan DGPS adalah sistim penentuan posisi Global (GPS) yang dilengkapi dengan peralatan radio komunikasi sebagai peralatan tambahan.

Dengan peralatan tambahan tersebut, ketelitian dari penentuan posisi Dapat dilakukan hingga lebih kecil dari 10 m dan juga dapat menyiarkan informasi/peringatan untuk rintangan yang tidak terdeteksi.

Revisi dari SOLAS V menetukan bahwa kapal diwajibkan untuk membawa AIS (Automatic Identification System) yaitu alat identifikasi otomatis pada bulan July 2002 dan sesudahnya, sesuai dengan jenis dan ukuran kapalnya.

AIS akan memancarkan posisi kapal secara periodik selama pelayaran.

Ketelitian dari penetuan posisi adalah sangat penting, oleh sebab itu penting untuk menggunakan sistim DGPS

17. DGPS is now operated in the world, including Malaysia, Singapore and India.

DGPS saat ini digunakan didunia, termasuk Malaysia, Singapore dan India

Do you know about it?

Apakah anda mengetahui mengenai hal tersebut

(1) yes, but don't have used it./Ya, tetapi tidak mempunyai alat tersebut

(2) no/tidak

(3) yes, and have experience to use it.

ya, dan berpengalaman menggunakan alat tersebut

18. Do you think the DGPS should be operated in the Indonesian sea area? Apakah anda berpendapat bahwa DGPS harus digunakan di perairan Indonesia?

(1) yes/ya (2) No/tidak

If you answered (1) y e s in question 18. above, please answer the following. Jika jawaban anda adalah (1) y a pada pertanyaan no.18 diatas, silahkan jawab pertanyaan berikut ini

- (1) Congested Sea Area, for example ______ Perairan yang sibuk, Contohnya
- (2) Port/ Harbor area or sea areas approaching to the navigational route. Pelabuhan atau alur pelayaran dekat pelabuhan for example/Contohnya______
- (3) Narrow channel sea areas, for example ______ Alur sempit dilautan,contohnya
- (4) Fishing operation sea areas, for example______ Lokasi tempat pemancingan dilaut, contohnya
- (5) Other sea areas, for example ______ Lokasi-lokasi lain, contohnya
- 19. It is considered that the desirable accuracy of positioning is differ from position to position. If you have any idea concerning the desirable accuracy to the specific area, please write it in the table below.

Sebagaimana diketahui bahwa ketelitian yang diinginkan pada penentuan posisi adalah berbeda antara satu lokasi dengan lokasi lainnya, jika anda mempunyai pendapat sehubungan dengan ketelitian yang diinginkan pada area tertentu, silahkan isi tabel dibawah ini.

<i>Lokasi atau Jalur</i> Area or route	Ketelitian yang diinginkan Desirable accuracy	Alasan Reason
(contoh) Lokasi A	Antara 10 m	Banyak karang dan
(example) A area	Within 10m	Anjungan minyak
		Many reefs and oil
		platforms

20. Your Contact Address

alamat anda

NAME/NAMA : ADDRESS/ALAMAT: TEL/TELPON : FAX : E-Mail :

# Thank you very much

for your sincere and faithful cooperation for filling up!

Terima kasih banyak atas partisipasi anda dalam mengisi daftar pertanyaan ini.

No.		Propinsi /	DISNAV/ADPEL/KANPEL	Address
Ι	Daera	h Istimewa A	Aceh	
	1	SUB DISNA	AV SABANG	Jl. Panglima Polim No.1 Sabang 23521
	2	ADPEL	Malahayati	Jl. Pelabuhan No.10 Ulee Lhue
	3	ADPEL	Lho Seumawe	Jl. Pelabuhan Lhokseumawe,
	4	ADPEL	Sabang	Jl. Malahayati No.1 Sabang,
	5	ADPEL	Kuala Langsa	Jl. Pelabuhan Lkuala Langsa,
	6	ADPEL	Meulaboh	Jl. T. Chik Di Tiro No. 17 Meulaboh,
	7	KANPEL	Idi	Jl. Pettua Hussain Komp. Pelabuhan Idi.
-	8	KANPEL	Tapak Tuan	Jl. Merdeka No. 41 Tapaktuan.
	9	KASATKER	Singkil	JI, A. Yani No. 53 Singkil, Dearh Istimewa Aceh
	10	KANPEL	Sinahang	II. Nasional, Sinabang, Daerah Isimewa Aceh
	11	KANPEL	Calang	Il Pelahuhan 11 Calang
	12	KANPEL	Susoh	Il Dt. Digaduang Desa Pasang Baru, Susoh Aceh Selatan
П	Suma	tera Utara	Suboli	on Dei Digududing Debu i usung Duru, Subon Meen Benutun,
	1	DISNAV KI	S II BELAWAN	Il Suar Lliung Baru No. 2 Belawan 25217
	2	SUBDISNA	V SIBOLGA	Il Horas No. 5 Sibolga 22531
	3	ADPFI	Belawan	Il Lliung Baru Terminal Penumpang Lt II Belawan
	4		Pangkalan Susu/Pangkalan Brandan	Il Palahuhan No. 5 Pangkalan Susu 20858
	5		Tanjung Balai Asahan	Il Polohuhan Toluk Nihung 21351
	5	ADPEL	Kuolo Toniung	Il. Delebuhan Kuele Tenjung 21957
	7		Sibolaa	Il Horas No. Sibolas 22521
	0	ADPEL	Cupung Sitel:	JI. HULAS INU. SHUURA 64001, Il Vas Sudarsa Na. Currung Sitali 22012
<u> </u>	0	KANDET	Guiluig Sitoli Taluk Dalam Niac	JI. 105 Sudarso No. 4 Tabuk Dalam 20005
┣───	9 10	KANPEL	Cinembu	JI. 105 SUUAISO INO. 4 TELUK DAIAIII 44803,
	10	KANPEL	Sirombu	JI. Pelabunan Angin No. 1 Sirombu 22863,
	11	KANPEL	Lahewa	JI. Bowo No. 1 Lahewa 22853,
	12	KANPEL	Pulau Tello	JI. Pelabuhan No. 1 Pulau Tello 22881,
	13	KANPEL	Pantai Cermin	Jl. Pemandian No. 465 Pantai Cermin 20857,
	14	KANPEL	Tg. Beringin	Jl. Nelayan No. 9 Tanjung Beringin 20696,
	15	KANPEL	Pangkalan Dodek	Jl. T. Amir Hamzah Pangkalan Dodek 21258,
	16	KANPEL	Tanjung Tiram	Jl. Merdeka No. 9 Tanjung Tiram 21253,
	17	KANPEL	Leidong	Jl. Bandar No. 79 Leidong 21475,
	18	KANPEL	Tj. Sarang Elang	Jl. Panglima Sudirman No. 4 Labuhan Bilik 21472,
	19	KANPEL	Sikara Kara	Jl. Pelabuhan No. 28 Natal 22987,
	20	KANPEL	S. Berombang	Jl. Syahbandar No. 79 Sei Berombang,
	21	KANPEL	Barus	Jl. Pelabuhan No. 2 Barus 22881,
	22	KANPEL	Tg. Pura	Jl. Pembangunan No. 175 Tanjung Pura 20853,
	23	KANPEL	P. Kampai	Jl. Pelabuhan No. 28 Pulau Kampai 20858,
III.	Suma	tera Barat		
	1	DISNAV KI	.S. II TELUK BAYUR	Jl. Banjarmasin No. 2 Teluk Bayur 25217,
	2	ADPEL	Teluk Bayur	Jl. Tg. Priok No. 4 Padang 62017,
	3	ADPEL	Air Bangis	Jl. Air Bengis,
	4	KANPEL	Sioban	Jl. Pelabuhan No. 1 Sioban,
	5	KANPEL	Muara Siberut	Jl. Raya Pelabuhan No. 1 Siberut 25393,
	6	KANPEL	Sikakap	Pelabuhan Sikakap,
IV.	Riau		•	
	1	DISNAV KI	S.I Tanjung Pinang	Jl. Samudra No.18 Tanjung Pinang
	2	DISNAV KI	S.I DUMAI	Jl. Datuk Laksamana Dumai 28814.
	3	ADPEL	Dumai	Jl. Datuk Laksamana No. 5 Dumai 28814.
<u> </u>	4	ADPEL	Pekanbaru	Jl. Kampung Dalam No. 1 Pekanbaru
<u> </u>	5	ADPEL	Tembilahan	Jl. Jend Sudirman No. 75 Tembilahan
	6	ADPEL	Bengkalis	Jl. Svahbandar No. 4 Bengkalis
	7	ADPEI	Selat Paniang	JI Pelabuhan No. 2. Selat Paniang
<u> </u>	8	ADPEI	Bagan Siani ani	Jl. Svahhandar No. 48 Bagan Siani ani
<u> </u>	9	ADPFI	Rengat	Il Rava Tembilahan K. Cinaku, Rengat
	10	ADPFI	To Balai Karimun	Il Yos Sudarso No. 1. Taniung Balai Karimun
	11	KANPEI	Pulau Sambu	Pulau Samhu
	11	KANDEI	Ta Liban	I Nusa Indah No. 1. Tanjung Uhan
	12	KANDEI	Sungai Dakning	Il Vas Sudarso No. 1. Sungai Dakning
	13	KANDEI	Jungai Fakillig Tarampa	JI. 105 Suuaiso 190, 1 Sullgal Fakillig, Il Palahuhan Parintis No. 1 Tarampa
<u> </u>	14	KANDET	Ta Batu	Il Domudo No. 21 Toniung Dotu
<u> </u>	10	KANDEL	ig. Datu	JI. Femuua No. 21 Tanjung Dalu,
	10	KANDEL	Deha Singkar	JI. Napt. Muchtar 100. 5 Sel Guntung,
┝───	1/	KANDEL	Бало Биідкер	JI. Felabulian Dabo Singkep,
	18	KANPEL	Senayang	HI. NUSANTARA INO. 2 Senayang 29173,
	19	KANPEL		JI. Pelabunan INO. Z. Kuala Elok,
┝───	20	KANPEL	Kuala Gaung	JI. Pelabuhan No. Z Kuala Gaung,
	21	KANPEL	Sinebui	JI. Pelabuhan No. 257 Sinebui,
L	22	KANPEL	Ig. Medang	JI. Laksamana No. 03 Tanjung Medang,
	23	KANPEL	Panipahan	JI. Bakti No. 11 Panipahan,

No.		Propinsi /	DISNAV/ADPEL/KANPEL	Address
	24	KANPEL	Batu Panjang	Jl. Pelabuhan No. 1 Batu Panjang - Rupat,
	25	KANPEL	Kijang Bintan Timur	Jl. Hang Jebat No. 29 Kijang Bintan Timur,
	26	KANPEL	Batam	Jl. Lumba - Lumba No. 5 Batu Ampar Batam,
V.	Jamb	i		
	1	ADPEL	Jambi	Jl. Sultan Taha No. 4 ,
	2	ADPEL	Muara Sabak/Kuala Tungkal	Pelabuhan Kuala Tungkal,
	3	KANPEL	Nipah Panjang	Jl. Pelabuhan No. 1 Nipah Panjang Kab. Tanjung Jabung,
	4	KANPEL	Kuala Mendahara	Jl. Pelabuhan No. 1 Kuala Mendahara Kab. Tanjung Jabung,
VI.	Beng	kulu		
	1	ADPEL	P. Bai / Bengkulu	Jl. Ir. Rustandi Sugianto Pulau Baai
	2	KANPEL	Malakoni Enggano	Jl. Kantor Pelabuhan Malakoni Enggano, Bengkulu Utara
	3	KANPEL	Linau Bintuhan	Jl. Pelabuhan Linau Bintuhan. Bengkulu Selatan
VII.	Suma	tera Selatan		, <u> </u>
	1	DISNAV K	LS. II PALEMBANG	Jl. Binyu No. 9 Palembang,
	2	ADPEL	Palembang	Jl. Belinyu No. 1 Boom Baru Palembang,
	3	ADPEL	Pangkal Balam	Jl. Yos Sudarso Pangkal Balam,
	4	ADPEL	Tg. Pandan	Jl. Pelabuhan No. 1 Tanjung Pandan,
	5	ADPEL	Muntok	Jl. Yos Sudarso Muntok,
	6	KANPEL	S. Lumpur	Jl. Sungai Lumpur ( OKI ),
	7	KANPEL	Manggar	Jl. Jend. Sudirman Manggar,
	8	KANPEL	Toboali	Jl. Pelabuhan No. 37 Toboali.
VIII	. Lamr	oung		, , , , , , , , , , , , , , , , , , ,
	1	ADPEL	Panjang	Jl. Kalimantan Pel. Panjang Bandar Lampung
	2	KANPEL	Menggala	Jl. Rava Pelabuhan Kp. Bugis No. 31 Menggala.
<u> </u>	3	KANPEL	Kota Agung	Jl. Samudra Kota Agung Tanggamus,
	4	KANPEL	Labuhan Maringgai	Kompleks Pelabuhan Maringgai Lampung Tengah
	5	KANPEL	Mesuii/Tulang Bawang	Kompleks Pelabuhan Mesuji, Kec. Mesuji Tulang Bawang .
	6	KANPEL	Teluk Betung	JI. Ikan Kembung No. 30 Teluk Betung - Bandar Lampung
IX.	DKI	Jakarta		
	1	DISNAV K	LS. I. TANJUNG PRIOK	.II. Ketel Kalijapat Tanjung Priok. Jakarta
	2	ADPEL	Sunda Kelana / Kalibaru	Il Baruna Raya No. 2 Pelabuhan Sunda Kelana Jakarta Utara
	3	KANPEL	Kalibaru	Il Pelabuhan Kalibaru No. 1 Jakarta Utara
x	Jawa	Barat		
	1	ADPEL	Cirebon	.II. Donggala No. 3 Cirebon, Jawa Barat
	2	ADPEL	Banten	JI. Plorida No. 102 Merak, Banten
	3	KANPEL	Anver Lor	JI. Pelabuhan Paku Anver. Banten
	4	KANPEL	Labuhan	JI. Pelelangan Ikan Da, Labuhan Serang, Banten
	5	KANPEL	Karang Antu	JI. Bandar Banten No. 1 Karangantu Serang, Banten
	6	KANPEL	Pelabuhan Ratu	Jl. Siliwangi Pelabuhan Ratu, Jawa Barat
	7	KANPEL	Pangandaran	Jl. Kidang Pananjung No. 229 Pangandaran Ciamis, Jawa Barat
	8	KANPEL	Pamanukan	JI. Taman Wisata Pondok Bali No. 2 Mayangan Pamanukan Subang, Jawa Barat
	9	KANPEL	Indramavu	JI. Pabean Udik No. 223 Indramayu. Jawa Barat
	10	KANPEL	Bojonegara	JI. Bojonegara Kn. Wades Kec. Bojonegara Serang, Banten
XI	Jawa	Tengah	Dojonegara	or. Dojonegara rip. Waaco rece Dojonegara Borang, Danten
	1	DISNAV K	LS II SEMARANG	.II. Yos Sudarso No.32 Semarang
	2	SUB DISN	AV CILACAP	Il Kebun Savur No. 15 Cilacan
	3	ADPEL	Cilacan	Il Niaga No. 9 Cilacan 53213
	4	ADPEI	Tegal	Il Kesatrian No. 6 Tegal
<u> </u>	5	KANPEL	Brebes	JI. TPI 15 Kluwut Bulakamba Brebes.
<u> </u>	6	KANPEL	Jepara	Jl. Patiunus Jepara.
<u> </u>	7	KANPEL	Karimuniawa	Jl. Pelabuhan No. 1 Karimuniawa.
<u> </u>	8	KANPEL	Juana	Jl. Hang Tuah 472 Juana Pati
<u> </u>	9	KANPEL	Rembang	Jl. Pelabuhan No. 2 Rembang 59212
	10	KANPEI	Batang	Il Laks Yos Sudarso Batang
<u> </u>	11	KANPEL	Pekalongan	JI. WR Supratman 79 Pekalongan
XII	Iawa	Timur	1 charongan	or who supractitation for renation gain,
	1	DISNAVK	LS. I SURABAYA	Jl. Perak Barat No. 435 A. Surabaya 60117
	2	ADPFI	Surabaya	Il Perak Barat No. 435 A Surahaya 60117
<u> </u>	3	ADPFI	Gresik / Tuban	Il Rava Pelabuhan Gresik
<u> </u>	4	ADPFI	Probalinggo	Il Tembaga Timur Probalinggo
<u> </u>	5	ADPEI	Meneng	Il Rava Situbondo Meneng
<u> </u>	6	ADPFI	Pasuruan	Il Rava Pelabuhan No. 158 Pasuruan
<u> </u>	7		Panarukan	Il Raya Pelahuhan Panarukan
<u> </u>	8		Kalianget	Il Rava Pelahuhan Kaliangat
<u> </u>	9	KANDEI	Bawaan	Il Raya Palahuhan Bawaan Madura
<b> </b>	10	KANDEI	Masalambo	Ji. Naya i ciabunan Dawean Mauura, Il Palahuhan Masalamba
<b> </b>	11	KANDEI	Tolaga Biru	Ji. 1 Clabuhan Masalembo, Il Dalabuhan No. 60 Talaga Rinu Maduna
<b> </b>	19	KANDEI	Branta	Ji. I Ciabulian Ivo. ou Iclaga Difu Maulia, Il Palahuhan Branta Branta
1	16	INDIAL EL	Dialita	JI. I GADUNAN DIANA, DIANA,

No.		Propinsi	DISNAV/ADPEL/KANPEL	Address
	13	KANPEL	Sepudi	Jl. Pelabuhan Sepudi, Sepudi,
	14	KANPEL	Sapeken	Jl. Pelabuhan Kalianget, Madura,
	15	KANPEL	Kalbut	Jl. Pelabuhan Kalbut,
	16	KANPEL	Brondong	Jl. Pelabuhan Brondong,
	17	KANPEL	Ketapang	Jl. Pelabuhan Ketapang Banyuwangi,
XIII.	Bali			
	1	DISNAV K	LS. II BENOA	Jl. Raya Pelabuhan Benoa, Denpasar 8000,
	2	ADPEL	Benoa	Jl. Pelabuhan Benoa, Denpasar,
	3	ADPEL	Padang Bai	Jl. Pelabuhan Padang Bai,
	4	ADPEL	Celukan Bawang	Jl. Pelabuhan No. 36, Celukan Bawang,
	5	KANPEL	Nusa Penida	Pelabuhan Nusa Penida
	6	KANPEL	Gilimanuk	Jl. Raya Pelabuhan Gilimanuk,
	7	KANPEL	Beleleng	Pelabuhan Buleleng,
XIV.	Nusa	Tenggara B	arat	
	1	ADPEL	Lembar	Kantor ADPEL Lembar, Lombok,
	2	ADPEL	Bima	Jl. Martadinata I Bima,
	3	ADPEL	Badas	Jl. Raya Pelabuhan Badas, Sumbawa Besar
	4	KANPEL	Labuhan Lombok	Jl. Pelabuhan Lb. Lombok,
	5	KANPEL	Sape	Jl. Pelabuhan Sape 84182, Kec. Sape, Kab. Bima,
	6	KANPEL	Calabai	Jl. Pelabuhan Calabai, Kab. Dompu,
	7	KANPEL	Pamenang/Tanjung	Jl. Pelabuhan Pamenang,
XV.	Nusa	Tenggara Ti	imur	
	1	DISNAV K	LS. II KUPANG	Jl. Yos Sudarso No. 54 Kupang,
	2	ADPEL	Waingapu	Jl. Pelabuhan Waingapu,
	3	ADPEL	Ende	Jl. Adi Sucipto Ende,
	4	ADPEL	Maumere	Jl. Pelabuhan Maumere,
	5	ADPEL	Tenau /Kupang	Jl. Yos Sudarso No. 27 Kupang,
	6	ADPEL	Kalabahi	Kalabahi,
	7	KANPEL	Larantuka	Jl. Niaga No. 71 Larantuka,
	8	KANPEL	Reo	Pelabuhan Reo,
	9	KANPEL	Waikelo	Waikelo, Sumba Barat,

No.	Propinsi /	/ DISNAV/ADPEL/KANPEL	Address
10	KANPEL	Atapupu	Kantor Pelabuhan Atapupu,
11	KANPEL	Baranusa	Baranusa, Alor,
12	KANPEL	Baa	Rote,
13	KANPEL	Seba / Sebu	Jl. Pelabuhan No. 1, Seba,
14	KANPEL	Mara Pokot	Kantor Pelabuhan Mara Pokot,
15	KANPEL	Labuhan Bajo	Pelabuhan Labuhan Bajo,
XVI. Kalir	nantan Bara	t	
1	SUB DISN.	AV PONTIANAK	JI. Rahadi Oesman No. 2 Pontianak
2	ADPEL	Pontianak Talah Air	JI. Ranadi Oesman No. 2 Pontianak
3	ADPEL	1 elok Alr Sintata / Demongkat	JI. Pelabuhan No. 1 Telok Alr,
- 4	ADPEL	Sintere / Feinangkat	JI. Felabulian No. 1 Sintete / Felilangkat,
6		Singkawang	JI. Merueka No. 20 Sambas. Il. Vos Sudarso, Singkawang
7	ADPEI	Ketanang	II. Gadiah Mada. Ketanang
8	KANPEL	Paloh / Sakura	Il. Rava Liku Paloh
9	KANPEL	Tl. Malano	JI. Gusti Anlos No. 39 Telok Malano.
10	KANPEL	Kendawangan	Jl. Rahadi Oesman No. 1 Kendawangan.
XVII. Kalir	nantan Teng	ah	
1	ADPEL	Sampit	Jl. Iskandar No. Sampit,
2	ADPEL	Pulang Pisau	Jl. Samudra No. 137 Pulang Pisau,
3	ADPEL	Pangkalan Bun	Jl. P. Antasari Gg. Kelapa Sawit Pangkalan Bun,
4	ADPEL	Samuda	Jl. H.M. Nur No. 5 Samuda,
5	ADPEL	Kuala Pembuang	Jl. Pelabuhan No. 6 Kuala Pembuang,
6	ADPEL	Kumai	Jl. Bendahara No. 200 Kumai,
7	ADPEL	Sukamara	Jl. Simpang Bankdes No. 14 Sukamara,
8	ADPEL	Kuala Kapuas	Jl. Jend. Sudirman No. Kuala Kapuas
9	KANPEL	Palangkaraya	Jl. Matal No. 7 Palangkaraya
10	KANPEL	Pegatan Mendawai	Jl. Merdeka No. 2 Pelabuhan. Mendawai
XVIII Kalir	nantan Selat	an	
1	SUB DISN.	AV BANJARMASIN	JI. Barito Hilir Banjarmasin,
2	ADPEL	Banjarmasin	JI. Pelabuhan I Kompleks Pelabuhan Trisakti Banjarmasin,
3	ADPEL	Kota Baru	JI. Pangeran Indra Kesuma Jaya, Kota Baru,
4	KANPEL	Sei Danau	JI. Kuripan Sungai Danau,
5	KANPEL	G. Batu Besar	JI. Pelabuhan Gunung Batu Besar Kota Baru,
7	KANPEL	Degeten Kete Peru	JI. Pelabunan No. 120 Simpang Empat Batuncin,
VIV Kalir	NANF EL	r agatali Kuta Dalu	JI. A. Talli No. 5 Fagatali Kota Dalu,
	DISNAV K	US I SAMARINDA	Il Lumba Lumba Samarinda 75116
2	DISNAV K	US II TARAKAN	Il Brigrad No. 36 Tarakan 77115
3	ADPEL	Samarinda	II. Yos Sudarso No. 2. Samarinda.
4	ADPEL	Balikpapan	JI. Yos Sudarso No. 1 Balikpapan.
5	ADPEL	Tarakan	Jl. Yos Sudarso No. 1 Tarakan.
6	KANPEL	Tanjung laut	Kompleks LNG Terminal Bontang Selatan,
7	KANPEL	Lhok Tuan	d/a Bagian Shipping PT. PKT Bontang Utara,
8	KANPEL	Sangata	Jl. Pelabuhan No. 3 Sangatta,
9	KANPEL	Sangkulirang	Jl. Pelabuhan No. 1 Sangkulirang,
10	KANPEL	Tanah Grogot	Jl. RE Martadinata No. 4 Tanah Grogot,
11	KANPEL	Tanjung Selor	Jl. Jend. Sudirman No. 16 Tanjung Selor,
12	KANPEL	Tanjung Redeb	Jl. P. Derawan No. 399 Tanjung Redeb,
13	KANPEL	S. Nyamuk	Jl. Hidayatullah Sebatik No. 6 Sungai Nyamuk,
14	KANPEL	P. Bunyu	Jl. Dermaga Pulau Bunyu,
15	KANPEL	Tanjung Santan	d/a Santan Terminal Tanjung Santan,
16	KANPEL	Kuala Samboja	JI. Yos Sudarso Balikpapan,
XX. Sula	wesi Utara		
1	DISNAV K	LS. II MANADO	JI. D.S. Sumolang No. 3 Manado 95113,
2	ADPEL	Bitung	Kompleks Pelabuhan Bitung
3	ADPEL	Gorontalo	Kompleks Pelabuhan Gorontalo
4	KANPEL	Lirung	Kompleks Pelabuhan Lirung
5	KANPEL	Lilu Ciau	Kampleha Delekuken Cien Kak Constructura
0	KANPEL	Diu Siau	Kompleks Pelabuhan Slau Kab. Sanger Lalaud
/	KANPEL	Detally Kotabunan	Kompleks Pelabuhan Belang, Kab. Minanasa
0	KANDEI	Labuhan Uki	Kompleks Pelabuhan Labuhan Liki Kab. Poimong
9	KANPEL	Labullali UKi Kwandang	Kompleks Pelabuhan Kwandang Kab Carontala
10	KANPEL	Tilamuta	Kompleks Pelahuhan Tilamuta, Kab. Corontalo
11	KANPEL	I ikunang	Kompleks Pelahuhan Likunang Kab. Minahasa
XXI Sular	wesi Tengah	zmupung	inompiono i clabanan Envapang, ixab. Milianaba
1	ADPEL	Toli Toli	Kompleks Pelabuhan Toli-Toli

No.	Propinsi	/ DISNAV/ADPEL/KANPEL	Address
2	ADPEL	Pantoloan / Donggala	Kompleks Pelabuhan Pantoloan Palu
3	KANPEL	Leok	Kompleks Pelabuhan Leok
4	KANPEL	Ogoamas	Kompleks Pelabuhan No. 7 Ogoamas
5	KANPEL	Poso	Jl. Patimura No. 3 Poso
6	KANPEL	Parigi	Jl. Pelabuhan No. 201 Parigi
7	KANPEL	Moutong	Kompleks Pelabuhan No. 9 Moutong
8	KANPEL	Ampana	Jl. Yos Sudarso No. 25 Ampana
9	KANPEL	Bunta	Jl. R.A. Kartini No. 42 Bunta
10	KANPEL	Pagimana	Jl. MT Haryono No. 103 C Pagimana
11	KANPEL	Luwuk	Kompleks Pelabuhan Jl. Yos Sudarso Luwuk
12	KANPEL	Banggai	Jl. Jend. Sudirman Banggai
13	KANPEL	Kolonedale	Jl. Pelabuhan No. 1 Kolonedale
14	KANPEL	Wani	Jl. Pelabuhan No. 6 Wani
XXII. Sula	wesi Selatan		
1	DISNAV K	KLS. I UJUNG PANDANG	Jl. Madura No. 1 Makassar
2	ADPEL	Pare - Pare	Pelabuhan Pare - Pare
3	KANPEL	Mamuju	Pelabuhan Mamuju
4	KANPEL	Majene	Pelabuhan Majene
5	KANPEL	Polewali	Pelabuhan Polewali
6	KANPEL	Malili	Pelabuhan Malili
7	KANPEL	Awareng / Barru	Pelabuhan Awareng Barru
8	KANPEL	Bulukumba	Jl. Yos Sudarso No. 7 Bulukumba
9	KANPEL	Jeneponto	Pelabuhan Jeneponto
10	KANPEL	Selayar	Jl. Pelabuhan No. 1 Selayar
11	KANPEL	Jampea	Pelabuhan Jampea
12	KANPEL	Sinjai	Pelabuhan Sinjai
13	KANPEL	Belang Belang	Pelabuhan Belang Belang
14	KANPEL	Bajoe	Pelabuhan Bajoe, Bone
15	KANPEL	Palopo	Pelabuhan Palopo
16	KANPEL	Siwa	Pelabuhan Siwa
17	KANPEL	Pattirobajo	Pelabuhan Pattirobajo
18	KANPEL	Biringkassi	Pelabuhan Blingkasi

No.	Propinsi / DISNAV/ADPEL/KANPEL	Address
XXIII Sulawesi Tenggara		
1	SUB DISNAV KENDARI	Jl. Jend. Sudirman No. 70 Kendari
2	ADPEL Kendari	Jl. Jend. Sudirman No. 68 Kendari
3	KANPEL Pomalaa	Jl. Protokol No. 1 Pomalaa
4	KANPEL Bau Bau	Jl. Yos Sudarso No. 5 Bau Bau
5	KANPEL Raha	Jl. Pelabuhan No. 3 Raha
6	KANPEL Kolaka	Pelabuhan Kolaka
7	KANPEL Cangara	Pelabuhan Cangara
XXIV. Maluku		
1	DISNAV KLS. I AMBON	Jl. Pantai Waihong No. 2 Ambon
2	ADPEL Ambon	Jl. Raya Patimura Ambon
3	ADPEL Ternate	Pelabuhan Ternate
4	KANPEL Tobelo	Pelabuhan Tobelo
5	KANPEL Labuha / Babang	Pelabuhan Labuha/Babang
6	KANPEL Soa Siu	Pelabuhan Soa Siu
7	KANPEL Sanana	Pelabuhan Sanana
8	KANPEL Namlea	Pelabuhan Namlea
9	KANPEL Amahai	Pelabuhan Amahai
10	KANPEL Geser	Pelabuhan Geser
11	KANPEL Tulehu	Pelabuhan Tulehu
12	KANPEL Tual	Pelabuhan Tual
13	KANPEL Dobo	Pelabuhan Dobo
14	KANPEL Saumlaki	Pelabuhan Saumlaki
15	KANPEL Benjina	Pelabuhan Benjina
16	KANPEL Jailolo	Pelabuhan Jailolo
17	KANPEL Daruba	Pelabuhan Daruba
18	KANPEL Laiwui	Pelabuhan Laiwui
19	KANPEL Leksua	Pelabuhan Leksua
20	KANPEL Wonreli	Pelabuhan Wonreli
21	KANPEL Buli	Pelabuhan Buli
22	KANPEL Wahai	Pelabuhan Wahai
23	KANPEL P. Gebe	Pelabuhan Pulau Gebe
24	KANPEL Waisarisa	Pelabuhan Waisarisa
#### Appendix 6.2.2. Location of Distribution of Qestionnaire on GPS Needs Incl.DGPS

No.	Propinsi / DISNAV/ADPEL/KANPEL	Address		
XXIV Irian	XXIV. Irian Jaya			
1	DISNAV KLS. I SORONG	Jl. Pemuda / Manggis Sorong		
2	DISNAV KLS. II JAYAPURA	Jl. Dr. Sam Ratulangi No. 10 Jayapura 99112		
3	SUB DISNAV MERAUKE	Jl. Moh. Yamin Merauke 99611		
4	ADPEL Jayapura	Jl. Koti Pelabuhan Jayapura 99221		
5	ADPEL Sorong	Jl. Jend. A. Yani 19 Sorong		
6	ADPEL Biak	Jl. Sudirman No. 53 Kotak Pos 562 Biak		
7	ADPEL Merauke	Jl. Sabang Merauke		
8	ADPEL Manokwari	Jl. Banjarmasin 06 Manokwari		
9	ADPEL Fakfak	Jl. Telus - Fak Fak		
10	KANPEL Serui	Jl. Moh. Hatta - Serui		
11	KANPEL Nabire / Tl. Kidu	Jl. Moh. Hatta - Nabire		
12	KANPEL Kaimana	Jl. Pelabuhan - Kaimana		
13	KANPEL Sardu / Sarmi	Jl. Brosili - Sarmi		
14	KANPEL Waren	Jl. Pelabuhan - Waren		
15	KANPEL Korido	Jl. Pelabuhan - Korido		
16	KANPEL Oransbari	Jl. Merdeka - Oransbari		
17	KANPEL Kaslor / Wasior	Jl. Pelabuhan - Wasior		
18	KANPEL Teminabuan	Jl. Pelabuhan - Teminabuan		
19	KANPEL Saunek	Jl. Pelabuhan - Saunek		
20	KANPEL Bintuni	Jl. Bintuni - Bintuni		
21	KANPEL Kokas	Jl. Pelabuhan - Kokas		
22	KANPEL Pomako	Jl. Pelabuhan - Pomako		
23	KANPEL Agast	Jl. Pelabuhan - Agast		
24	KANPEL Bade	Jl. Pelabuhan - Bade		
25	KANPEL Amampare	Jl. Pelabuhan - Amampare		

# Desirable accuracy, Location and Reason

No.	Area or Route	Accuracy	Reason
1	ALUR S. BARITO	< 10 M	SHALLOW WATER
2	BENOA	<10 M	STRONG WAVE&HEAVY TRAFFIC
3	SEL.LIMA	0 - 5 M	ROCK
4	SEL.BANGKA	0, 7 M	SHALLOW WATER AND ROCK
5	FROM P.KERAYAAN-TG ARU	0,5 M	A LOT OF OIL PLATFORM
6	FROM P.KERAYAAN-TG ARU	0,5 M	A LOT OF OIL PLATFORM
7	TG.BALAI-PANIPAHAN	0,5 MIL	PLATFORM
8	BG.ASAHAN-PANIPAHAN	0,5 MIL	
9	MAKASSAR STR	0,5 MIL	
10	SELAT SUNDA	0,5 NM	ROCK AND FERRY BUSY TRAFFIC
11	S'PORE STRAITS	0,50 MIL	ROCK AND A LOT OF SHIP
12	SEL.S'PORE	1 - 2 M	CONGESTED AREA
13	SELAT DURIAN	1 - 2 M	ROCK
14	SEL.TIORO	1 M	ROCK
15	ALOR STR	1 M	NARROW ROUTE&A LOT OF REEF
16	SELATMALAKA	1 MIL	A LOT OF BIG SHIP & SMALL ISLANDS
17	TG.PINANG-SEL.RIAU	1 MIL	RAIN AND ROCK
18	LEIDONG KE TG.BALAI (A)	1 MIL	LOG AND BARGAGE
19	TG.BALAI AS-PORT KLANG MALAYSIA	1 MIL	TRAP, SMALL SHIP
20	LEIDONG-TG.BALAI,1 MIL	1 MIL	TRAP, SMALL SHIP
21	LEIDONG-TG.BALAI	1 MIL	TRAP, SMALL SHIP
22	BG.ASAHAN-TG.LEDONG	1 MIL	
23	MADURA STR	1.5 M	A LOT OF"DANGKALAN"
24	MUSI RIVER	10 - 100 M	EDGE OF RIVER
25	GORONTALO&SEKITARNYA	10 - 100 M	
26	FAK-FAK IRIAN	10 - 100 M	
27	PANTAI TIMUR KALIMANTAN	10 - 1000	OIL PLATFORM
28	KWANDANG	10 - 1000	ROCK
29	TOLITOLI	10 - 1000	ROCK
30	SUNDA STRAIT	10 - 15 M	A LOT OF SHIP
31	PELABUHAN LHOTUAN BONTANG	10 - 15 M	ROCK
32	ENTRY ROUTE TO PANJANG PORT	10 - 20 M	A LOT OF FISHERMAN SHIP;
33	KIJANG ROUTE	10 - 20 M	A LOT OF REEF;
34	SELAT BANGKA	10 - 20 M	ROCK AND PLATFORM
35	SELAT MAKASAR	10 - 20 M	ROCK, REEF AND PLATFORM
36	JAKARTA BAY	10 - 20 M	HEAVY TRAFFIC
37	MUARA PALEMBANG	10 - 20 M	SEDIMENT
38	MAKASSAR-BIRINGKASSI	10 - 25 M	ROCK
39	SELAT SUNDA, BAKAHUNI-MERAK	10 - 30 M	ROCK, STRONG CURRENT AND FISHERMAN
40	ROUTE OF LABUHAN BEJO	10 - 40 M	PLATFORM AND REEF

No.	Area or Route	Accuracy	Reason
41	LAUT JAWA	10 - 50 M	A LOT OF OIL PLATFORM
42	TEL.BONE PANTAI TENGGARA	10 - 50 M	ROCK
43	JAVA SEA/BALONGAN	10 - 50 M	
44	ENTRY ROUTE TO MUSI RIVER AND PAI EMBANG	10 M	SEDIMENT
45	SINGAPURA STRAIT	10 M	ROCK AND WRECK
46	ALUR PELABUHAN SURABAYA	10 M	SEDIMENT
47	ALUR TIMUR PEL. SURABAYA/SELAT MADURA	10 M	SEDIMENT
48	BELAWAN APPROACH	10 M	NARROW CHANNEL
49	ALUR MASUK PELABUHAN TANJUNG PANDAN/BELITUNG	10 M	A LOT OF SAND AND ROCK
50	PEL.SIBOLGA	10 M	ROCK
51	PEL.SIBOLGA	10 M	ROCK
52	EAST ROUTE OF SURABAYA	10 M	SEDIMENT
53	ENTRY ROUTE TO RIAU RIVER-TG UBAN	10 M	A LOT OF SEDIMENT
54	ENTRY ROUTE TO RIAU RIVER-TG UBAN	10 M	A LOT OF SEDIMENT
55	RIAU ISLANDS STRAIT	10 M	A LOT OF SEDIMENT AND NARROW CHANNEL
56	ENTRY ROUTE TO MUSI RIVER AND PALEMBANG	10 M	A LOT OF SEDIMENT
57	ALANG TIGA	10 M	A LOT OF REEF
58	BUTON STRAIT	10 M	A LOT OF REEF
59	SAFE STRAITS	10 M	A LOT OF REEF
60	TG PANDAN	10 M	A LOT OF REEF
61	TIORO STR&SELE STR	10 M	A LOT OF REEF
62	SERIBU ISLANDS	10 M	A LOT OF REEF & OIL PLATFORM
63	SELAT DURIAN	10 M	A LOT OF REEF,
64	JAKARTA-BELAWAN	10 M	A LOT OF REEF,OIL PLATFORM
65	MAKASSAR-HALMAHERA	10 M	A LOT OF REEF,OIL PLATFORM
66	SURABAYA-IRIAN	10 M	A LOT OF REEF,OIL PLATFORM
67	SELAT BANGKA	10 M	A LOT OF REEF;
68	PONTIANAK ROUTE	10 M	A LOT OF REEF;
69	SELAT BANGKA	10 M	ERROR OM MAGNETIC COMPASS
70	SINGAPORE STRAITS	10 M	CONGESTED SEA AREA
71	SINGAPORE STRAITS	10 M	CONGESTED SEA AREA
72	ALUR SUNGAI BARITO	10 M	NARROW CHANNEL
73	SAMPIT	10 M	NARROW CHANNEL
74	ALUR PONTIANAK	10 M	NARROW CHANNEL AND BUSY
75	ALUR MUSI(PLG)	10 M	NARROW CHANNEL AND SHALLOW WATER
76	SUNGAI BARITO	10 M	CONGESTED SEA AREA
77	GOSONG MUARA JELAI	10 M	STRONG CURRENT
78	GOSONG MUARA JELAI	10 M	STRONG CURRENT
79	MUARA BERAU	10 M	TIDAL CURRENT
80	LAUT JAWA	10 M	A LOT OF PLATFORM
81	LAUT JAWA	10 M	PLATFORM AND FOG
82	SELAT BANGKA	10 M	A LOT OF SHIP
83	PEL MOUTONG	10 M	ROCK

No.	Area or Route	Accuracy	Reason
84	SELAT BANGKA	10 M	ROCK
85	S. MALAKA & S. SINGAPORE	10 M	SHIP TRAFFIC
86	SELAT DURIAN	10 M	MANY ISLAND
87	SELAT DURIAN	10 M	MANY ISLAND
88	SURABAYA-KR JAMUANG	10 M	CHANNEL
89	MALACCA STRAIT	10 M	CONGESTED SEA AREA
90	BANJARMASIN NARROW CHANNEL WATERS	10 M	SHALLOW WATER
91	ALUR MASUK PONTIANAK	10 M	SHALLOW WATER
92	BELAWAN	10 M	SHALLOW WATER
93	SURABAYA	10 M	SHALLOW WATER
94	ROUTE OF MERAUKE	10 M	ROCK AND SEDIMENT
95	1.13,10 N,103 .54,80 E	10 M	ENTRY PORT ROUTE
96	113'10"N/10354'80"E	10 M	ENTRY ROUTE TO PORT
97	MALACCA STRAIT	10 M	HEAVY TRAFFIC;
98	ALUR MASUK PEL.BAJOE-KOLAKA	10 M	ROCK
99	JAMPEA	10 M	ROCK
100	s. Makasar	10 M	ROCK AND FISHERMAN
101	SELAT BANGKA	10 M	ROCK, NARROW CHANNEL
102	L.JAWA,JAMUANG,SBY	10 M	ROCK AND OIL PLATFORM
103	ALUR MASUK S.BARITO-SBY	10 M	CONGESTED AREA
104	SUNGAI BARINTO	10 M	30 M CHANNEL
105	SUNGAI BATANG HARI	10 M	60 M CHANNEL
106	JAKARTA	10 M	MANY OBSTRUCTION
107	SAMARINDA	10 M	MANY OIL RIGS;
108	KEPULAUAN SERIBU	10 M	MANY OILFIELD(PLATFORM
109	TG. KARAWANG	10 M	MANY PLATFORMS
110	BANGKA STRAIT	10 M	MANY REEF & BANK
111	NORT COAST OF JAVA	10 M	MANY REEF & OIL PLATFORM;
112	SOUTHERN PART P.SIMEDANG	10 M	MANY REEF &WRECK
113	MAKASSAR STRAIT	10 M	MANY REEF;
114	SELAT BANGKA, DURIAN,BERHALA	10 M	MANY REEF;
115	BIRINGKASSI AREA	10 M	MANY REEFS
116	KOTABARU-BATULICIN	10 M	MANY REEFS
117	BANGKA STRAIT	10 M	MANY REET&NARROW
118	MALACA STRAIT	10 M	NARROW CHANNEL
119	BANJARMASIN ROUTE	10 M	NARROW ROUTE&HEAVY TRAFFIC
120	ENTRY ROUTE TO TEMBILAHAN	10 M	NARROW SEA
121	ENTRY ROUTE TO TEMBILAHAN	10 M	NARROW SEA;
122	EAST COAST SUMATERA	10 M	OIL PLATFORM
123	NORTH COAST JAVA	10 M	OIL PLATFORM
124	ALUR PELAYARAN MENUJU PEL.PONTIANAK	10 M	BUSY TRAFFIC
125	MUARA SEI BARITO	10 M	BUSY TRAFFIC

No.	Area or Route	Accuracy	Reason
126	SELAT SUNDA	10 M	BUSY TRAFFIC
127	SELAT SUNDA	10 M	BUSY TRAFFIC
128	TG. PRIOK	10 M	BUSY TRAFFIC
129	SELAT SUNDA	10 M	BUSY TRAFFIC
130	SEL. SINGAPORE	10 M	BUSY TRAFFIC
131	MUARA KETAPANG	10 M	SHALLOW WATER
132	SELATSINGAPURA	10 M	BUSY TRAFFIC
133	ALUR PELAYARAN MENUJU PEL.PANGKAL BALAM BANGKA	10 M	NARROW CHANNEL AND BUSY
134	SEL.BERHALA	10 M	NARROW CHANNEL AND STRONG CURRENT
135	SEL.P.PENASI ACEH	10 M	NARROW CHANNEL AND STRONG CURRENT
136	SELAT RIAU	10 M	NARROW CHANNEL AND STRONG CURRENT
137	SEL.BANGKA	10 M	NARROW CHANNEL
138	SEL.SUNDA	10 M	NARROW CHANNEL
139	S'PORE(SINKI FAIRWAY)	10 M	BUSY TRAFFIC & A LOT OF REEF
140	BALI STRAIT	10 M	STRONG STREAM, A LOT OF FERRYS
141	SELAT SUNDA	10 M	SURVEY LEPAS PANTAI
142	MUARA KUALA JELAI	10 M	NO LIGHT/ SHALLOW WATERS
143	BANGKA STRAIT	10 M	THE INFLUENCE OF MAGNETIC TIN
144	SUNGAI SIAK	10 M	VERRY SHALLOW
145	BANJARMASIN	10 M	
146	ENTRY ROUTE MAKASSAR PORT	10 M	
147	ENTRY ROUTE MAKASSAR PORT	10 M	
148	JAVA SEA	10 M	
149	PONTIANAK	10 M	
150	SELAT BANGKA	10 M	
151	SINGAPORE STRAIT	10 M	
152	BANGKA STRAIT	10 M	A LOT OF REEF
153	MACASSAR STRAIT	100 M	A LOT OF REEF,FISHING BOAT,OIL PLATFORMS
154	SUNDA STRAIT	100 M	CURRENT
155	JAVA SEA EAST COAST OF KALIMANTAN	100 M	MANY REEFS AND OIL PLATFORM
156	S. MALACA	100 M	BUSY TRAFFIC, A LOT OF REEF
157	MALACA STRAIT	100 M	SHALLOW WATER AREA;
158	BANGKA STRAIT	100 M	
159	MAKASAR STRAIT	100 M	
160	FAK-FAK IRIAN	10-100 M	
161	GORONTALO&SEKITARNYA	10-100 M	
162	SUNDA STRAIT	10-15 M	A LOT OF SHIP
163	ENTRY ROUTE TO PANJANG PORT	10-20 M	A LOT OF FISHERMAN SHIP
164	KIJANG ROUTE	10-20 M	A LOT OF REEF
165	CIUTAN LARANTUKA	10-20 M	STRONG CURRENT, A LOT OF REEF
166	BIMA	10-20 M	A LOT OF OIL PLATFORM
167	ALUR BANJARMASIN	10-20 M	HEAVY TRAFFIC
168	ALUR BANJARMASIN	10-20 M	HEAVY TRAFFIC

No.	Area or Route	Accuracy	Reason
169	JAKARTA BAY	10-20 M	HEAVY TRAFFIC
170	ALUR MUARA S.KAPUAS/S.SAMBAS	10-25 M	
171	TEL.BONE PANTAI TENGGARA	10-50 M	A LOT OF REEF
172	BALIKPAPAN	10-50 M	
173	BANGKA STRAIT	10-50 M	
174	MUARA VEGA(SAMARINDA)	15 - 19 M	SEA EROTION
175	GOSONG ARU	15 M	A LOT OF FERRYS RUINS
176	REO	15 M	A LOT OF REEF
177	100'80"N/10301'00"E	150 M	A LOT OF REEF
178	1.00,80 N,103.01,00 E	150 M	A LOT OF REEF
179	SEL.DURIAN	2 - 3 M	NARROW CHANNEL
180	SEL.BANGKA	2 - 3 M	NARROW CHANNEL
181	JAVA SEA	2 M	A LOT OF REEF
182	ALUR SUNGAI BARITO	2 M	BUSY TRAFFIC
183	SELAT MALAKA	2 MIL	THICK FOG
184	LEIDONG KE TG.BALAI (A)	2 MIL	A LOT OF FERRYS RUINS
185	TG.PERAK REDE	20 - 40	A LOT OF FERRYS RUINS
186	ALUR DUMAI	20 M	A LOT OF FERRYS RUINS
187	SELAT BANGKA	20 M	A LOT OF FISHERMAN BOAT RUINS
188	ROUTE TO BENOA PORT	20 M	A LOT OF REEF
189	ROUTE TO BENOA PORT	20 M	A LOT OF REEF
190	SAMPIT ROUTE	20 M	
191	ALUR KUMAI	20 M	SHALLOW WATER AREA / A LOT OF "DANGKALAN" :
192	ENTER PEL.POMALAA	20 M	A LOT OF REEF
193	SELAT TIORA	20 M	A LOT OF REEF
194	LOK.B-P.TERKULAI/P.BUSUNG	200 M	A LOT OF REEF
195	1.12,85 N,103.41,00	200 M	A LOT OF REEF
196	ALUR MASUK PEL. BANGKA	20-30 M	A LOT OF SHALLOW WATER AREA ("DANGKALAN" OR "GOSONG")
197	ALUR MASUK S.KAPUAS	20-30 M	A LOT OF SHALLOW WATER AREA ("DANGKALAN" OR "GOSONG")
198	BANJARMASIN PORT	3 M	HIGHTIDE LEVEL
199	SELAT MAKASSAR, SEBELAH TENGGARA P KATIMANTAN	30 - 70 M	BUSY TRAFFIC & A LOT OF FERRYS
200	ENTER PEL.2 KALTIM	30 M	A LOT OF PLATFORMS
201	GOSONG MUARA JELAI	30 M	STRONG CURRENT
202	GOSONG MUARA JELAI	30 M	STRONG CURRENT
203	GASONG JELAR	30 M	A LOT OF REEF
204	LOK.C-KARANG GALANG/BATU BESAR	400 M	A LOT OF REEF
205	SUNGAI MUSI,SUNGAI MAHAKAM	5 - 10 M	NARROW CHANNEL, A LOT OF SHALLOW WATER AREA,
206	SELAT GALASA	5 - 10 M	A LOT OF REEF
207	GELASA STRAIT&JAVA SEA	5 - 10 NM	INTERNATIONAL ROUTE
208	ALUR MUARA S.KAPUAS KECIL	5 M	NARROW CHANNEL
209	ALUR MASUK TARAKAN	5 M	STRONG CURRENT & A LOT OF SHALLOW WATER AREA

No.	Area or Route	Accuracy	Reason
210	MASUK ALUR SUNGAI SIAK (RIAU) PEKAN BARU	5 M	THICK FOG
211	BINTAN RIVER&IRJA	5 M	NARROW ROUTE
212	BANJARMASIN ROUTE	5 M	
213	BANJARMASIN ROUTE	5 M	
214	BALIKPAPAN PORT	5 M	A LOT OF REEFS
215	BANGKA STR	50 M	A LOT OF SHIP RUINS
216	BALIKPAPAN	50 M	A LOT OF OIL PLATFORM
217	BANGKA STR	50 M	A LOT OF SHIP RUINS
218	SEL.TIORO-SULTRA	50 M	A LOT OF REEFS
219	TEL.KUMAI	50 M	A LOT OF REEFS
220	LOK.D-SEL.JOHOR/SEL.NANAS/P.UBIN	50 M	KELONG IKAN
221	NEAR BONTANG	50 M	MOVING BIG, EXPENSIVE SHIPS
222	S. DURIAN	50 M	BUSY TRAFFIC & A LOT OF REEFS
223	S.BANGKA	50 M	BUSY TRAFFIC & A LOT OF REEFS
224	TG.PELANG TO SEA	50 M	
225	ALUR MUARA SUNGAI BARITO	5-10 M	BUSY TRAFFIC
226	SELAT PANJANG PATH	6 - 10 M	STRONG CURRENT
227	ENTRY ROUTE OF PANGKAL BALAM PORT	7 M	A LOT OF "DANGKALAN" (SHALLOW WATER AREA
228	ENTRY ROUTE OF PANGKAL BALAM PORT	7 M	A LOT OF "DANGKALAN" (SHALLOW WATER AREA
229	KETAPANG - GILI MANUK	7 M	A LOT OF REEF
230	LAUT JAWA	8 - 10 M	A LOT OF OIL PLATFORM
231	MUARA KUALA JELAI	8 M	BUSY TRAFFIC

### Name of Domestic Ports Often Use

NO.	NAME OF PORTS	NUMBER OF SHIP
1	SURABAYA	161
2	JAKARTA/TG.PRIOK	157
3	PONTIANAK	107
4	MAKASAR	72
5	BALIKPAPAN	56
6	DUMAI	57
7	BENOA	52
8	TEGAL	51
9	BANJARMASIN	46
10	SAMPIT	43
11	BELAWAN	45
12	PALEMBANG	44
13	SUKAMARA	42
14	SEMARANG	42
15	SUNDA KELAPA	42
16	JAMBI	37
17	TG PINANG	30
18	CILACAP	28
19	SAMARINDA	23
20	PANJANG	27
21	BITUNG	26
22	SV57A	21
23	TG PANDAN	20
24	TG. BALAI	18
25	KIJANG	17
26	KETAPANG	16
27	CIREBON	16
28	TOLI TOLI	14
29	GRESIK	13
30	TUAL	12
31	TELUK AIR	12
32	TARAKAN	9
33	PANGKALAN BUN	10
34	KOTABARU	4
35	BANYUWANGI	12
36	PADANG/TL BAYUR	11
37	MERAK	10
38	KUPANG	9
39	КИМАІ	10
40	BONTANG	5
41	BAU-BAU	5
42	BATULICIN	10
43	BATAM / SEKUPANG	11
44	BAGAN SIAPI-API	11
45	SORONG	10
46	PLAJU	9
47	PARE PARE	9
48	MUARA BARU	10

49	BATAM	10
50	PANGKAL BALAM	9
51	LEMBONGAN	9
52	KARANGANTU	9
53	BIRINGKASI	9
54	AMBON	9
55	SINTETE	4
56	SELAT PANJANG	8
57	PALU	8
58	PAGATAN	8
59	MERAUKE	8
60	KOLAKA	8
61	KENDARI	6
62	JAYAPURA	8
63	GILIMANUK	8
64	BELITUNG	8
65	HANDII SENIPAH	7
66		6
67		5
68	PEMANGKAT	3
60		4
70		6
70	DAPO	6
71		0
72		0
73		0
74		U
75	SIBULGA	5
76	PASURUAN	5
77	PAKANBARU	5
78		5
79		5
80	KENDAWANGAN	5
81	KATIGAN	5
82	ENDE	5
83	BIAK	5
84	BATAM / TG. UBAN	5
85	ΑΤΑΡυρυ	5
86	TEMBILAHAN	4
87	SIWA	3
88	SINGKAWANG	4
89	PULANG PISAU	2
90	PROBOLINGGO	2
91	PANIPAHAN	4
92	P. HALANG	4
93	LAMPUNG	4
94	KUALA ENOK	4
95	DAWI-DAWI	29
96	BERAU / TG. REDEB	4
97	BENTENG / SELAYAR	4
98	BANGKA	4
99	ТАКЕМРА	3
100	TANAH GROGOT	3

102         SANTAN         3           103         S. PAKNING         3           104         PERAWANG         3           105         PADANGBAY         3           106         P. SAMBU         3           107         MENGGALA         3           108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3	
103         S. PAKNING         3           104         PERAWANG         3           105         PADANGBAY         3           106         P. SAMBU         3           107         MENGGALA         3           108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
104         PERAWANG         3           105         PADANGBAY         3           106         P. SAMBU         3           107         MENGGALA         3           108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
105         PADANGBAY         3           106         P. SAMBU         3           107         MENGGALA         3           108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
106         P. SAMBU         3           107         MENGGALA         3           108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
107         MENGGALA         3           108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
108         MARTAPURA BARU         3           109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
109         MANOKWARI         3           110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
110         MAMUJU         3           111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
111         LEIDONG         3           112         CALABAY         3           113         WAINGAPU         2	
112         CALABAY         3           113         WAINGAPU         2	
113 WAINGAPU 2	
Z	
114 TARJUN 2	
115 T. PELAYAR 2	
116 SERASAN 2	
117 SENAYANG 2	
118 SEKARAMBUT 2	
119 SAMBAS 30	
120 S. DANAU 2	
121 PEKALONGAN 2	
122 PALOPO 2	
123 MAUMERE 1	
124 LARANTUKA 2	
125 KUALA KAPUAS 7	
126 KARANG AGUNG 2	
127 KANTINGAN 2	
128 KALIMAS 2	
129 KALIBARU 2	
130 KALIANGET 2	
131 KALABAHI 2	
132 KAIMANA 2	
133 K. TUNGKAL 2	
134 GALELA 2	
135 FAK FAK 2	
<b>136 BENJINA</b> 5	
137 BENGKULU / P. BAY 2	
138 BENGKALIS 2	
139 BENGALON 2	
140 BATAM / BATUAMPAR 2	
141 AIR HITAM 2	
142 TIMIKA 1	
143 TG. BATU 1	
144 SINJAI 32	
145 SINABOY 3	
146 SERUI 1	
147 RAHA 1	
148 PANGKAL PINANG 1	
149 P. TEMBE 29	
150 P. CAWAN 1	
151 P. BUNYU 1	
152 P. BANGKO 29	

153	NUSA PENIDA	1
154	NABIRE	1
155	MUARA PANTAI	9
156	MEULABOH	1
157	MARUNDA	1
158	MAJENE	1
159	LUWUK	1
160	LHOK TUAN	1
161	LHOK INGA	1
162	LAWE-LAWE	1
163	LABUAN	1
164	KOLONEDALE	1
165	GUNUNG SITOLI	1
166	CIGADING	29
167	BULUKUMBA	1
168	BULI	1
169	BIMA	1
170	BALONGAN	1
171	BADAS	1
172	AMAHAI	1
		2129

#### Name of International Ports of Often Use

NO.	NAME OF PORTS	NUMBER OF SHIP	PERCENT
1	SINGAPORE	108	32.34%
2	MALAYSIA	20	5.99%
3	JAPAN	19	5.69%
4	PORTKLANG	12	3.59%
5	HONGKONG	10	2.99%
6	TAIWAN	9	2.69%
7	CHINA	8	2.40%
8	INDIA	7	2.10%
9	P. GUDANG	5	1.50%
10	PHILIPHINES	5	1.50%
11	AUSTRALIA	5	1.50%
12	BANGKOK	4	1.20%
13	PENANG	4	1.20%
14	SAMECHEONPO	4	1.20%
15	KAOHSIUNG	4	1.20%
16	HOUSTON	3	0.90%
17	INCHON	3	0.90%
18	JOHOR BARU	3	0.90%
19	KOREA	3	0.90%
20	STULANG LAUT	3	0.90%
21	VIETNAM	3	0.90%
22	RICHARD BAY	3	0.90%
23	CALCUTA	2	0.60%
24	CHITTAGONG	2	0.60%
25	COLOMBO	2	0.60%
26	DARWIN	2	0.60%
27	HO CHIN MINH	2	0.60%
28	KINABALU	2	0.60%
29	KUCHING	2	0.60%
30	MAHACHAI	2	0.60%
31	NAMPO	2	0.60%
32	OSAKA	2	0.60%
33	P. TIOMAN	2	0.60%
34	QINHUANGDAO	2	0.60%
35	ROTTERDAM	2	0.60%
36	SEMATAN	2	0.60%
37	TAICHUNG	2	0.60%
38	WTC (SINGAPORE)	2	0.60%
39	YOKOHAMA	2	0.60%
40	BRAZIL	2	0.60%
41	AFRICA	1	0.30%
42	ANTNERP	1	0.30%
43	BANGLADESH	1	0.30%
44	BINTULU	1	0.30%
45	CANADA	1	0.30%

Appendix 6.2.5.

46	CHENNAI	1	0.30%
47	CHILI	1	0.30%
48	CHRISTMAS ISLAND		0.30%
49	DAHAMU	1	0.30%
50	DAVAO	1	0.30%
51	FUJAIRAH		0.30%
52	GEN	1	0.30%
53	GLADSTONE	1	0.30%
54	HALDIA	1	0.30%
55	HAMBURG	1	0.30%
56	JASAAN	1	0.30%
57	KANDLA	1	0.30%
58	KARACHI	1	0.30%
59	KAWASAKI	1	0.30%
60	KERTEN	1	0.30%
61	KO JEONG	1	0.30%
62	KOJUNG	1	0.30%
63	KUANTAN	1	0.30%
64	KUWAIT	1	0.30%
65	MACHINOHE	1	0.30%
66	MADANG	1	0.30%
67	MAROCO	1	0.30%
68	MIYAZU	1	0.30%
69	MUNDRA	1	0.30%
70	MYANMAR	1	0.30%
71	NAGOYA	1	0.30%
72	NASSAU	1	0.30%
73	NIIGATA	1	0.30%
74	NINGBO	1	0.30%
75	OWASE	1	0.30%
76	P. GULF	1	0.30%
77	P. KELANG	1	0.30%
78	PERTH	1	0.30%
79	SANTOS	1	0.30%
80	SEPANGAR	1	0.30%
81	SHANGHAI	1	0.30%
82	SHANTAU	1	0.30%
83	SUEZ	1	0.30%
84	SYDNEY	1	0.30%
85	TABONEO	1	0.30%
86	TANAH MERAH	1	0.30%
87	TG. BELUNGKOR	1	0.30%
88	TIANJIN	1	0.30%
89	ТОКҮО	1	0.30%
90	VANCOUVER	1	0.30%
91	YSOSU	1	0.30%
92	YUNG AN	1	0.30%
93	ISRAEL	1	0.30%
	TOTAL NUMBER	334	100.00%

NO	Name of route	Number of Ship
1	JAVA SEA	354
3	MALACCA STRAIT	85
5	BANGKA STR	48
7	PASURUAN-KALIMANTAN	42
9	EAST INDONESIA REGION	27
11	RIAU STR	24
13	HINDIA-OCEAN	21
15	BALI SEA	20
17	DURIAN STR	17
19	OTHERS	17
21	BALI SEA	15
23	SEA LANES NO. 2	14
25	GELASA STR	13
27	BANDA SEA	13

NO	Name of route	Number of Ship
2	MAKASSAR STRAIT	102
4	SOUTH CHINA SEA	75
6	KALIMANTAN WATERS	45
8	SUNDA STRAITS	30
10	SINGAPORE STR	24
12	TRAMPER	24
14	NATUNA SEA	20
16	MIDDLE INDONESIA REGION	19
18	FLORES SEA	17
20	WEST COASTAL SUMATRA	16
22	KARIMATA STR	15
24	WEST INDONESIA REGION	13
26	BERHALA STR	13
28	MADURA STR	12

NO	Name of route	Number of Ship
29	JAKARTA	12
31	SULAWESI WATERS	9
33	PHILLIP STRAITS	7
35	ZEE	6
37	PASIFIK OCEAN	6
39	ARU SEA	6
41	BANDA SEA	5
43	SAWU SEA	5
45	SURABAYA	5
47	SV. 5/5	4
49	EAST COST SUMATRA	4
51	SERAM SEA	3
53	KALIMANTAN-JAWA	3
55	BANJARMASIN	3

NO	Name of route	Number of Ship
30	BONE BAY	11
32	API	8
34	SEA LANES NO. 1	7
36	MORONG STRAITS	6
38	ARAFURU SEA	6
40	LOMBOK STRAITS	6
42	SULAWESI WATERS	5
44	SURABAYA- BANJARMASIN PP	5
46	SAMBU STRAITS	4
48	BANJARMASIN- SURABAYA	4
50	TIORO STRAITS	3
52	PONTIANAK - TG. PRIOK	3
54	FAR EAST	3
56	AIR HITAM STRAITS	3

NO	Name of route	Number of Ship
57	WEST SURABAYA -ROUTE OF WEST KOTAWARINGIN STRAITS	3
59	SEKUPANG	2
61	SAPE STR	2
63	KIJANG STRAITS	2
65	BIRINGKASSI	2
67	SAGOWIN STRAITS	2
69	BIRINGKASSI	2
71	JAKARTA - PONTIANAK - JAKARTA	2
73	SIBOLGA-G.SITOLI	2
75	GASPAR STRAITS	2
77	SURABAYA - KUPANG	2
79	LOBAM STRAITS	2
81	WOWON STRAITS-KENDARI BAY	2
83	MUSI RIVER	1

NO	Name of route	Number of Ship
58	SV.31(1) C	2
60	SEA LANES NO.3	2
62	LAUT STRAITS	2
64	JOHOR STRAITS	2
66	KUPANG	2
68	TIMOR SEA	2
70	IRIAN JAYA WATERS	2
72	S.KELAPA-PONTIANAK	2
74	TG PRIOK - MAKASSAR	2
76	SUNDA KELAPA - PONTIANAK	2
78	SINGAPORE	2
80	BADUNG-SUMBA SEA	2
82	BARA CAPE	2
84	TUAL-ARU SEA WATERS	1

NO	Name of route	Number of Ship
85	TPI-SKP-TBK-SLP	1
87	TMFT TO TG.PINANG PORT	1
89	SV 31 ( 1 ) D	1
91	SURABAYA-SEMARANG- SINGAPORE	1
93	SURABAYA-MAKASSAR- SURABAYA-BALIKPAPAN	1
95	SURABAYA-MAKASSAR	1
97	SURABAYA-BATULICIN- BALIK PAPAN	1
99	SURABAYA-BALIKPAPAN, SURABAYA-MAKASSAR	1
101	SURABAYA - NTT	1
103	SIBUTU	1
105	SEMARANG-KALIMANTAN- SULAWESI-IRIAN	1
107	SELAYAR STRAIT	1
109	SAMPIT-PEMBUANG- BANJARMASIN	1
111	PERTAMINA PORT - PORT	1

NO	Name of route	Number of Ship
86	TOBALU-BATUNDONG	1
88	SV.1935(1) D	1
90	SURABAYA-TOLITOLI	1
92	SURABAYA-SEMARANG	1
94	SURABAYA-MAKASSAR- SORONG-NABIRE-JAYA PURA	1
96	SURABAYA-DILI- MAKASSAR-SURABAYA	1
98	SURABAYA-BATAM- BELAWAN	1
100	SURABAYA - TARAKAN	1
102	SURABAYA - BANJARMASIN	1
104	SEMARANG-SINGAPORE	1
106	SELAYAR STRAITS	1
108	SAPE STRAITS	1
110	S.KELAPA-PONTIANAK- SUNDA KELAPA- BELITUNG, SUNDA KELAPA-BANCKA	1
112	PENYEBERANGAN SIBOLGA-NIAS	1

NO	Name of route	Number of Ship
113	PELENG STRAITS	1
115	PANJANG - SURABAYA	1
117	PANJANG	1
119	MUARA PEGAH	1
121	MERAK	1
123	MASALEMBU SEA	1
125	MALAYSIA SEA	1
127	LOMBOK-CALABAY-BATU LICIN	1
129	LEMBAR/BIMA	1
131	KUALA JOHOR	1
133	JAKARTA-SURABAYA	1
135	JAKARTA-PONTIANAK	1
137	JAKARTA-P.BALAM- BELITUNG-JAKARTA	1
139	JAKARTA-BELAWAN	1

NO	Name of route	Number of Ship
114	PEKAN BARU-TG PRIOK- PONTIANAK-TG PERAK- TLK BAYUR	1
116	PANJANG - CHINA	1
118	OMBAI STRAITS	1
120	MINDORO STR	1
122	MENTOK STRAITS	1
124	MALUKU TENGGARA	1
126	MAHAKAM STR- MAHAKAM RIVER	1
128	LOMBOK-CALABAY	1
130	KUALA TANJUNG - CHINA	1
132	KOMODO ISLANDS	1
134	JAKARTA-SINGAPORE- SURABAYA-SEMARANG	1
136	JAKARTA-PADANG- SURABAYA	1
138	JAKARTA-BELAWAN, SURABAYA-MAKASSAR	1
140	JAKARTA - WEST PHILIPINE	1

NO	Name of route	Number of Ship
141	JAKARTA - TG. PANDAN/BELITUNG	1
143	JAKARTA - PANJANG - SINGAPORE	1
145	IRIAN JAYA-AMBON	1
147	BENJINA	1
149	BELAWAN	1
151	BATULICIN-TG.SERDANG	1
153	BATAM-BALIKPAPAN	1
155	BANYUWANGI-NTT-MALUKU	1
157	BALIKPAPAN-SURABAYA	1
159	BALIKPAPAN-PARE/PARE- TARAKAN	1
161	DUMAI	1
163	MALUKU - NATUNA	1
165	SUMATRA WEST COAST	1
167	YELLOW SEA	1

NO	Name of route	Number of Ship
142	JAKARTA - IRIAN JAYA	1
144	JAKARTA - SURABAYA	1
146	BENTENG- TAKABONERATE	1
148	BELAWAN-DUMAI	1
150	BAUR STRAITS	1
152	BATULICIN-CENGAL	1
154	BATAM TO JAKARTA	1
156	BALI-NTT-NTB	1
158	BALIKPAPAN-PAREPARE- DONGGALA	1
160	MALAYSIA SEA	1
162	BULAN STRAITS	1
164	SAPUDI STRAIT	1
166	TELUK LAMPUNG	1
168	ALUR SAMPIT, DUMAI, SAMARINADA	1

NO	Name of route	Number of Ship
169	AMAMAPARE TO JAPAN OR CHINA	1
171	BAJUNGKAL	1
173	BALIKPAPAN - DUMAI	1
175	BIRA - PAMATATA/SELAYAR	1
177	BIRINGKASSI-TARJUN- BITUNG-UJUNG PANDANG	1
179	CALABAY-BALI- BANYUWANGI	1
181	EAST COAST SUMATRA. WEST & NORTH SUMATRA	1
183	GEBE-POMALAA-CEPEE	1
185	INDM.EAST MEDITERRIAN	1
187	INDONESIA-SINGAPURA	1
189	JAKARTA-TG.PINANG	1
191	JAWA-IRIAN	1
193	JKT-BITUNG-BONTANG- BANJAR	1
195	KALIMANTAN - SUMATRA	1

NO	Name of route	Number of Ship
170	ANAMBAS ISLANDS	1
172	BALIK PAPAN-TARAKAN	1
174	BALIKPAPAN- BANJARMASIN- SAMARINDA	1
176	BIRINGKASSI- PHILIPHINES	1
178	BORNEO,TAIWAN	1
180	CENDERAWASIH BAY	1
182	ENGGANO ISLAND COASTAL TO CILACAP ANS T. SEMANGKA	1
184	GULF OF THAILAND - TANA SEA	1
186	IND-CHINA/HKG-TAIWAN- MALAYSIA	1
188	JAKARTA-TELUK BAYUR- SURABAYA-PELAONG	1
190	JAWA-FLORES- NENGGARA	1
192	JAWA-SUMATERA	1
194	KALIMANTAN - SULAWESI, IRIAN - MALUKU, SUMATRA - IAWA	1
196	KALIMANTAN -JAWA- SUMATRA-BANJAR	1

NO	Name of route	Number of Ship
197	KALIMANTAN-SUKAMARA- TEGAL	1
199	KARIMUN JAWA	1
201	NATUNA-BATAM-JAKARTA	1
203	NORTH SEA IRIAN JAYA	1
205	NP44	1
207	PALEMBANG-MERAK, BANGKA-MERAK	1
209	PALEMBANG-SEMARANG- SURABAYA-CIREBON	1
211	PANCUR-SENAYANG- TG.PINANG	1
213	PANJAI KALSEL	1
215	SIJORI	1
217	SINGAPORE-IND	1
219	SINGAPORE-TG.PINANG	1
221	SUKAMARA	1
223	SULAWESI UTARA-TENGAH	1

NO	Name of route	Number of Ship
198	KALIMANTAN-TEGAL	1
200	KATIGAN	1
202	NORTH OF JAVA TO ATAPUPU	1
204	NP 17	1
206	PALEMBANG-JAMBI- PEMANGKAT-SAMPIT	1
208	PALEMBANG-SEMARANG- SURABAYA-CILACAP	1
210	PALEMBANG-SINGAPORE	1
212	PANGKALAN BUN- TG.PRIOK-KIJANG- BALIK.PAPAN	1
214	SIBOLGA-NIAS	1
216	SINGAPORE - CILACAP	1
218	SINGAPORE-SEL.BULAN	1
220	SOUTH JAVA-BALI	1
222	SULAWESI PORT-JAWA	1
224	SULSEL-NTT	1

NO	Name of route	Number of Ship
225	SUNDA KELAPA-TG PANDAN	1
227	TAIWAN-INDONESIAN	1
229	TANJUNG PRIOK- BANJARMASIN	1
231	TEL.POH-TEL.TOMINI	1
233	TELUK LAMPUNG	1
235	TG PANDAN-PANGKAL BALAM	1
237	TG PRIOK-TAREMPA	1
239	TG.PRIOK-KIJANG- BALIKPAPAN-PANGKALAN BUN	1
241	WEST COASTAL KALIMANTAN-SERAWAK- SABAH	1
243	SETAN SEA	1
245	BENETY BAY	1

NO	Name of route	Number of Ship
226	SUNGAI DANAU	1
228	TANAH GORGOT TO PAITON & BACK	1
230	TEL. BAYUR - TG. PRIOK - PALEMBANG	1
232	TELUK DALAM - PADANG- PANTAI BARAT SUMATRA	1
234	TEMBELAN BAY	1
236	TG PERAK - NUNUKAN	1
238	TG.LEDONG-TG.BALAI ASAHAN	1
240	WEST COAST OF PHILIPPINE VI A BASSI STRAIT	1
242	WEST SURABAYA-JAWA SEA- ROUTE OF WEST KOTAWARINGIN STRAITS	1
244	TIMOR SEA	1
246	INDONESIA CHARTS	1

# Location of Ship Having Difficulty

NO	Name of Ship	LOCATION	HOUR
1	YONG TAT 9	AROUND OF RIAU STRAIT	1-24
2	YONG TAT 12	AROUND OF RIAU STRAIT	1-24
3	MT. PANOIL 8	BALIKPAPAN-BANJARMASIN	1-3 JAM
4	MV.MARINA EXPRESS	1.06'.350" N-00.55'.000" N,104.11'.500" E-104.13'.000" E	2
5	KM. GANDA DEWATA	ALKI NO.1	4
6	MT SINAR EMAS	ALKI NO.1	8
7	MV JULIANTO MOELIODIHARDJO	ALKI NO.1	10
8	MV. HERO	ALKI No.1	10 HOURS
9	BUNGA KERAYONG	ALL NAMED LINES	4
10	MV.EASTERN HERO	ALL SEA AREA	DURING HEAVY RAIN
11	KIJANG 3	ANGAPME STRAIT	1
12	KM MANOKWARI	ARU SEA	46
13	MV BATAM LING 2	BACK OF PUDANG ISLAND (BATAM)	10
14	WAKA LOUKA CRUISE	BADUNG STR	4
15	KM QUICK SILVER VII	BADUNG STR	1
16	MV. ARENA II	BALAI CAPE	30 MENIT
17	MT DEWAYANI	BALI STR/MAKASSAR STR	3;8
18	K.M.P TRISILA BHAKTI I	BALI STRAIT	0.5
19	KM ARTHA 2	BANDA SEA	2
20	MV APIRACHAI REEFER	BANDA SEA	24
21	MV. SITIUNG	BANGKA STRAIT	0.25
22	MV. GANESA	BANGKA & MALACA STRAIT	10
23	MT TRIHASTA I (YFPL)	BANGKA STR	
24	MT PANDAN	BANGKA STR	6
25	MV OTONG KOSASIH	BANGKA STR	12
26	MV ARTHA 8	BANGKA STR	3
27	MT TIRTA NIAGA IV	BANGKA STR/PALEMBANG	
28	AT PUTERI JELITA	BANGKA STR;MALACCA STR	12;24
29	MV. RACHMANUEL - I	BANGKA STRAIT	2
30	TANTO HAWARI	BANGKA STRAIT	10
31	KM BAHTERA AGUNG I	BANGKA STRAIT	24
32	MT SHINTA	BANGKA STRAIT	6
33	MT. TRIHASTA I	BANGKA STRAIT	4-6

Appendix 6.2.7.

NO	Name of Ship	LOCATION	HOUR
34	MV. LESTARI AGUNG	BANGKA STRAIT	
35	MT. EKA SAMUDRA	BANGKA STRAIT	11
36		BANGKA STRAIT	6
37	KM JUPITER	BANGKA STRAIT	4
38	KM TEGUH SEJATI	BANGKA STRAIT	4
39	MT KATOMAS	BANGKA STRAIT	
40	MV SWADAYA	BANGKA STRAIT	4
41	MT PULAU GEBE	BANGKA STRAIT	2
42	KM HOLLY RAYA	BANGKA STRAIT - BERHALA STRAIT	12
43	MT. SEKAR LAUT	BANGKA STRAIT & DURIAN STRAIT	1 0,5
44	MT BESI V	BANGKA STRAIT & MALAKA STRAIT	1 MONTH
45	KM SIRIMAU	BANGKA STRAIT & MALAKA STRAIT	NIL
46	MT PEMATANG/P1021	BANGKA STRAIT- DURIAN STRAIT	2
47	MV.FGA 8	BANGKA STRAIT, DURIAN STRAIT	4
48	KM LIANNA	BANGKA STRAIT; ALANG BERHALA	5
49	KM. TANTO SINERGI	BANGKA STRAIT; JAWA SEA; MAKASSAR STRAIT	8;2;2
50	MT MERBAU/PERTAMI NA 37	BANGKA STRAIT; RIAU STR	6;2
51	MV. BELAWAN III.38	BANJARMASIN NARROW CHANNEL WATERS	2 JAM
52	CARAKA JAYA NIAGA III-8	BARITO ESTUARY	3
53	TB PROGRESS FUTURE	BARITO RIVER	6
54	KM. MARINA NUSANTARA	BARITO RIVER	
55	MV. EGON	BARITO RIVER	2.5
56	KM. MARINA NUSANTARA	BARITO RIVER	1 JAM
57	BOTANY TREASURE	BATAM	4
58	KM. LESTARI MAKMUR	BERHALA STRAIT	4
59	MV .MARINA BARU	BONE BAY	
60	KMP. KALEBI	BONE BAY	2-3
61	MV. ARENA III	BULAN STRAIT, PHILIP STRAIT	1
62	MV ARENA III	BULAN STRAIT;PHILIP STRAIT	1
63	KM.MARINA PERMAI 88	BULON ISLAND	0,75
64	KM. SHORYU I	BUTON STRAIT	3
65	MT. ASTA SAMUDRA	CELEBES SEA	1
66	MT ASTA SAMUDRA /3 FTE 4	CELEBES SEA	1
67	MT. ISTANA VI	CHANEL AT PORT OF BELAWAN	2 HOURS

Appendix 6.2.7.

NO	Name of Ship	LOCATION	HOUR
0.0	MV DIAMOND		0
68	REEFER	CHANNEL TUAL	2
		DAERAH TG SELATAN / AMBANG	
69	KM. BINA SETIA	LUAR BARITO	
70	KN. MENGKARA	DEWAKANG	3
71	SINAR MUDA	DURIAN STR/MALAKA STR	6;2
70	MV. PRIMA		1
12	SAMUDRA	DURIAN STRATT	1
73	BITUMIN KALLEX	DURIAN STRAIT	1-2
74	JAKARTA LLOYD		
/4	SHIP	DURIAN STRATT	
75	WM HADADAN	DURIAN STRAIT; SERIBU ISLANDS,	6.5
75	ΜΜ. ΠΑΚΑΡΑΝ	JAWA SEA	0;5
76	MV UNIDUUS	DURIAN STRAIT;SOUTH CHINA SEA	2.6.19
70	WIV. UNIPLUS	NORTH PART	5, 0-12
77	CP BRATASENA /	EAST COASTAL OF SUMATRA	9
11	YCYB	EAST COASTAL OF SUMATRA	2
78	KC CISADANE	ENTRY ROUTE KAPUAS RIVER,	1.1
70	KC. CISADANE	ENTRY ROUTE TO BANGKA PORT	1,1
79	TB TRIDAYA	ENTRY ROUTE TO SIAK RIVER	15
10	BARUNA V	ENTRY ROOTE TO STAR RIVER	1.0
80	KM BRASTACI II	ENTRY ROUTE TO PONTIANAK	2
00	RW DRASTACT II	PORT	~
81	MV ARENA II	ENTRY ROUTE TO TG BALAI	1/2
01		KARIMUN PORT	1/2
82	MT. GAZ HUDSON	FUROPE	
02	V.08		
83	MP.	FAK FAK SEA TO KAIMANA	3
	KELIMUTU/YDFE		
84	SURABAYA QUEEN	FAR EAST AREA	3
85	MARITIME LIGHT	FLORES SEA	4
86	MT AMBO	FLORES SEA	4
	PELLAWA		
07			30
87	KOMODO ISLANDS	GALASA STR	MINUTE
00			5
88		GELASA SIK	3
89 00		GELASA SIRAH CELASA STRAH	ა 10
90		GELASA STRAIT	10
91		GELASA SIKAII	30 36
32		GELASA SIKAH	30
93	FYDRESS 1	GELASA STRAIT & BANK STR	2
Q <i>1</i>	ΗΔΥΙΛΥΙΛΥΛ	INDONESIA OCEAN	9
94		IABUNG CAPE DURIAN STRAIT	يم 1
		SABONG CALE, DOMAN STRAIT	T
96	KARYA	JAKARTA BAY	6
97	BARITO II	IAMPEA	20
98	MV BARITO II	JAMPFA	1/4
99	MV BRAVE HEART	JAPAN AREA	4
100	PUSRI INDONESIA	.JAVA SEA	5
	MV OYONG		-
101	KOSASIH	JAVA SEA	5
102	MORNING STAR	JAVA SEA	5

Appendix 6.2.7.

NO	Name of Ship	LOCATION	HOUR
102	MV KAPUAS	JAVA SEA, WEST COAST OF	9
105	EXPRESS I	KALIMANTAN	2
104	KM KANNONSAN	JAWA SEA	24
105	KM LAWIT	JAWA SEA	4
106	KM MARINA INDAH	JAWA SEA	1
107	Kfe. AMBULU	JAWA SEA	2 HOURS
108	KM SARANA PERKASA	JAWA SEA	28
109	ARIES	JAWA SEA/BETWEEN KARIMUN ISLANDS-KALIMANTAN	12
110	NV. BATAM LINE	JOHOR STRAIT	40 MENIT
111	MARINA INDAH 8	JOHOR STRAIT- NANAS STRAIT	15 MENIT
112	TB ROBBY 84	JORONG,KALSEL	1
113	TOKYO QUEEN	KALIMANTAN	4
114	KM. MARINA BARU II	KALIMANTAN TENGAH	NO LIMIT
115	KFC MAHAKAM	KAPUAS	2
116	FALCON 3	KARANG GALANG	20 MENIT
117	FALCON 3	KARANG GALANG	20 MENIT
118	MV ANDIKA MITRA EXPRESS	KARIMATA STR	3.5
119	KM BENUA SANDAI GT 260	KARIMATA STRAIT	FOG & BAD WEATHE R
120	KM JAYA AGUNG	KARIMATA STRAIT	24
121	KM KAJUARA MULIA	KARIMATA STRAIT	12
122	AMBER SUITE	KEP. MENTAWAI	2.5
123	MV SEA BREEZE ADVENTURER	KOMODO AREA	4
124	AERO SPEED II NO.1671 PPB	KUALA BAGAN ASAHAN KE TG.LEDONG,KABUT ASAP	
125	KM ERA JAYA	KUALA JELAI RIVER	2
<u>12</u> 6	HARAPAN BARU I	KUALA JELAI RIVER	2-3
127	BINTANG SELATAN	KUALA JELAI RIVER	2-3
128	KM.WIJAYA PRIMA	KUALA JELAI RIVER ESTUARY	1,5
129	KM.ERA MAKMUR	KUALA JELAI RIVER ESTUARY	2
130	KLM.SINAR BUNGA	KUALA JELAI RIVER ESTUARY	1,5
131	KLM.CITRA CINTA	KUALA JELAI RIVER ESTUARY	1,5
132	KLM SAMUDRA RAYA	KUALA JELAI RIVER ESTUARY	1.5
133	KLM.PANGGULAN BARAT	KUALA JELAI RIVER ESTUARY	3-4
134	TB.SDS.18	KUALA JELAI RIVER ESTUARY	3
135	KARYA JAYA II	KUALA JELAI RIVER ESTUARY	3-4

Appendix 6.2.7.

NO	Name of Ship	LOCATION	HOUR
136		KUALA JELAI RIVER ESTUARY	3-4
137	SINAR ASCA	KUALA JELAI RIVER ESTUARY	2-3
138	PUTRA INDAH	KUALA JELAI RIVER ESTUARY	2-5
139	KLM.PUTRA SUKMA	KUALA JELAI RIVER ESTUARY	1-3
140	KLM.GUNDA GULANA	KUALA JELAI RIVER ESTUARY	1-2
141	SINAR USAHA JAYA I	KUALA JELAI RIVER ESTUARY	1-2
142	MAKMUR II	KUALA JELAI RIVER ESTUARY	2-3
143	KLM.EL BAHAR	KUALA JELAI RIVER ESTUARY	1-3
144	KLM.NORLY INDAH III	KUALA JELAI RIVER ESTUARY	1-3
145	KLM.BABUS SYA'DAH	KUALA JELAI RIVER ESTUARY	O,5-1
146	KLM.ARTA III	KUALA JELAI RIVER ESTUARY	2
147	KLM.SAHABAT MUSLIMIN	KUALA JELAI RIVER ESTUARY	3-4
148	KAHENDA ACE	KUALA JOHOR SINGAPORE	1
149	TB. PEC 248	KUALA KAPUAS	5 JAM
150	RUKUN ISLAM	KUPANG	3
151	KMP. MUCHLISA	LINTAS BAJOE	1
152	KM BOUNTY CRUISES	LOMBOK STR	15 MINUTE S
153	KMP. MANDALA NUSANTARA	MACASSAR STRAIT	1
154	KM TRISIENDRA PRATIWI	MADURA STR	3
155	TB SF 94	MAHAKAM RIVER, SAMARINDA	8
156	MV . MERATUS EXPRESS	MAKASAR STRAIT	6
157	MV. DERAJAT	MAKASAR STRAIT	1
158	MT PAN OIL 9	MAKASSAR STR	1
159	TB SOZA GLORY	MAKASSAR STR	2
160	KM. BUNGA TERATAI	MAKASSAR STRAIT	3
161	CYPRESS	MALACA STRAIT	15
162	MT. PRABUMENANG KADEPE	MALACA STRAIT	30
163	MT. DUTARYO III	MALACA STRAIT	24
164	MV. MITRA UTAMA	MALACA STRAIT	
165	MT. SUPERIN - I	MALACA STRAIT	2
<u>166</u>	MV. BRASTAGI	MALACA STRAIT	12
167	MT. SANYO	MALACA STRAIT	4
168	MT. SINAR BUNYU	MALACA STRAIT DUE TO POG	4
169	NEE DIAK I	MALACCA STR	8
170	KM BINTANG JAYA	MALACCA STR	24
171	CB. ABEER THIRTY ONE	MALACCA STR	3
172	MV SALINDO PERDANA I	MALACCA STRAIT	4
173	KN ADHARA	MALACCA STRAIT& SINGAPORE	2

Appendix 6.2.7.

NO	Name of Ship	Ship LOCATION			
174	MT RAHAH	MALACCA STRAIT& SINGAPORE	4		
175	MT SOUTHERN MERMAID	MALACCA STRAITS	72		
176	KM MITRA PACIFIC	MALACCA STRAITS	2		
177	ISLAND JADE	MALACCA STRAITS	2		
178	JO CLIPPER	MALACCA/SINGAPORE STRAITS	1,5		
179	MT. SALAWATI/P.3004	MALAKA STRAIT			
180	MT. CATUR SAMUDRA	MALAKA STRAIT			
181	MT. PEGADEN/P.1024	MALAKA STRAIT	20		
182	KM MITRA PASIFIC	MALAKA STRAIT	2		
183	MT SEPINGGAN /P. 300 8	MALAKA STRAIT	2		
184	KM KARUNIA LESTARI II	MALAKA STRAIT	4		
185	MV .GANESA	MALAKA STRAIT, BANGKA STRAIT	2		
186	TANTO SINERGI	MALAKA STRAIT, BANGKA STRAIT	6,4		
187	KLM LAKSANA ILAHI	MASALEMBU	24		
100	KM. TERATAI	MUARA PEGA SAMARINDA, TG.			
188	PRIMA	LERO PAREPARE	1-2		
189	KM. KASIM	MUARA PEMANGKAT			
190	KM PULAU SINGKEP	MUSI RIVER	LONG DURATI ON		
191	M.T. HAFEZAH	MUSI RIVER	36986		
192	MV OTONG KOSASIH	MUSI RIVER	4		
193	MT. NIAGA ENERGI - I	MUSI RIVER	1		
194	MV ABUSAMAH	MUSI RIVER/BANGKA STRAIT	20		
195	KM. KUMALA NUR	NATUNA SEA	48		
196	KM TANJUNG MAS INDAH	NATUNA SEA	1 MONTH		
197	RUBIN POWER	NEAR JAPAN SEA	MORE THAN 24 HOURS		
198	KM NUSA TEMINI	NERONG STRAIT (ALUR TUAL)	15 MENIT		
199	KLM. MS. ADHI SETIA	NORTH OF KARIMUN JAWA	1		
200	MV. KAYU LAPIS ENAM	PADANG TIKAR TO TEL.AYER	5		
201	KM SWAKARSA	PALEMBANG			
202	MV. SUN KUNG	PALEMBANG(MUSI RIVER);SAMARINDA INSIDE RIVER	20-24;10		
203	KM. CAHAYA BARU I	PONOLIMBU KE TAMANG ISLAND	11,5		
204	MT SERANG JAYA / P.3011	ROUTE AROUND SURABAYA WATERS	2		
205	NEE DIAR I	ROUTE OF BANJARMASIN SEA	2.5		

Appendix 6.2.7.

NO	Name of Ship	LOCATION	HOUR
206	LCT GEBE JAYA TIGA	ROUTE OF BANJARMASIN SEA	4
207	BINA SETIA	ROUTE OF BARITO RIVER	3 JAM
208	BINA SETIA III	ROUTE OF BARITO RIVER	3 JAM
209	CAHAYA REZEKI	ROUTE TO KUALA JELAI RIVER ESTUARY	1-2
210	DUA SEKAWAN	ROUTE TO KUALA JELAI RIVER ESTUARY	1-2
211	NOOR INDAH	ROUTE TO KUALA JELAI RIVER ESTUARY	5-8
212	KLM.PUTRA MADURA	ROUTE TO KUALA JELAI RIVER ESTUARY	2-4
213	KLM.ANAK MAS	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
214	KLM.BINTANG NEGARA	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
215	KM.RATNA INDAH	ROUTE TO KUALA JELAI RIVER ESTUARY	1-2
216	KM.BERKAT ILAHI	ROUTE TO KUALA JELAI RIVER ESTUARY	1-1,5
217	BINTANG MAS EKA JAYA	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
218	SINAR TIMBUL JAYA	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
219	REZEKI BARU	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
220	KLM.SINAR FAJAR	ROUTE TO KUALA JELAI RIVER ESTUARY	2-2,5
221	KLM.RAHMAT ILAHI	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
222	KLM. MARIWA	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
223	KLM.PUTRI SOLO	ROUTE TO KUALA JELAI RIVER ESTUARY	2-3
224	KM. SINAR SAMODRA VIII	ROUTE TO BARITO RIVER	3 JAM
225	KLM SOJOURN	ROUTE TO BENOA HARBOUR	2
226	KARYA SEJATI	ROUTE TO KUALA JELAI RIVER	2-4
227	KM. TONASA MARINDO	ROUTE TO MAHAKAM RIVER PORT/SAMARINDA	2
228	KM BINAIYA	ROUTE TO SAMPIT PORT; SAMARINDA, JAVA SEA	2;2;1
229	KMP.PONCAN MOALEE	ROUTE TO SIBOLGA WATERS	2
230	MT BROTOJOYO	SAGEWIN STRAIT	4
231	MT. BROTOJOYO	SAGOWIN STRAIT-SORONG	3
232	MV. MOSSESU	SAWU SEA	15
233	KFC MAHAKAM	SEA ROUTE OF PONTIANAK	2
234	KM. SINAR USAHA JAYA	SEALANG No.1	2
235	TB. NELLY VII / TK NELLY II	SEI JAMBI, MUSI RIVER, JAWA SEA	
236	MT ASTA SAMUDRA / 3FTEH	SELEBES SEA	1 HOUR

Appendix 6.2.7.

NO	Name of Ship	Ship LOCATION			
237	TB CIPTO SERAYA	SIAK RIVER	2		
238	HAZEL ACE	SIAK RIVER	24		
239	MT. ALLORO	SINGAPORE STRAIT	0.5		
240	MV SINAR JAYA	SINGAPORE STRAIT	3		
241	MV. PESUT II	SINGAPORE STRAIT	2		
242	MT FILMA SATU	SINGAPORE STRAIT	4		
243	MV RIVER SPIRIT	SINGAPORE STRAIT	3		
244	PENGUIN 16	SINGAPURA STRAIT	15 MENIT		
245	PENGUIN TIOMAN	SOUTH CHINA SEA	2		
246	KM LUWUK	SOUTH CHINA SEA	12		
247	KM GUNUNG POTENG JAYA III	SOUTH CHINA SEA	24		
248	MT. KIRANA PRATAMA	SOUTH CHINA SEA	36893		
249	MT. BELICIA	SOUTH CHINA SEA	72		
250	MV UN BONG	SOUTH CHINA SEA	3		
251	LCT KIMTRANS VIRGO	SOUTH CHINA SEA	3		
252	MV WELL PESCADORES	SULAWESI SEA	2		
253	M.V. TARAHAN	SUNDA STRAIT	1		
254	MV BAHTERA PACIFIC	SURABAYA WEST CHANNEL	3		
255	QUJIANG	TAIWAN STRAIT	22		
256	KN TAKA LAMUNGAN	TAKA BONE RATE WATERS	6		
257	CARAKA JAYA NIAGA III-25	TG PRIOK / KARAWANG CAPE	3		
258	MV. TANTO SEJATI	TG. PERAK	1.5		
259	GANDINI	TG. PRIOK	2		
260	KM. BULUSEPPANG	TIORO STRAIT	6		
261	KM.BINTAN SAMUDRA	TOBALU CAPE / SIWA CAPE	0.5		
262	TB. DAYA KENCANA	TOMINI BAY	10		
263	LCT. BHAITA CATURTYA	VICINITY OF SUMATRA ISLAND	SEVERA L WEEKS		
264	M/T CHARIOT	W. LURUS	48		
265	M.T. LAJU PRAKARSA II WEST COAST OF BORNEO		4		
266	KM JASA WIJAYA GT 362	WEST KALIMANTAN			
267	KM.MITRAMAS 6 WETAR STRAITS		12		
268	TIMBER DYNASTY YELLOW SEA		2		
269	MT. MONALISA	YELLOW SEA, CHINA COAST	11		
270 MV. SMART REEFER SATU		YELOW SEA	15		

#### Sea Disaster

No.	Name of Ship	Experience of The sea Disaster (Location & Causes)					
1	KM SAMODRA 36	14-50S/110-00E, TRAPPED IN CYCLON STORM					
2	KM.BINTAN	2 MILL BEFORE SIWA THICK FOC					
2	SAMUDRA	2 WILL DEFORE SIWA, THICK FOG					
3	KM TRISIENDRA	ALAS STR. BAD WEATHER&BIG WAVE					
	PRATIWI						
4 F	KM BINAIYA	ROUTE TO SAMPIT; SHALLOW WATERS					
5	IB CIPIO SERAYA	AROUND SINABOI ISLAND					
0	WIV TATAWAILAU WM I FSTADI	DADAS ROUTE, HEAVI KAIN					
7	MAKMUR	BANGKA STRAITS (ENGINE TROUBLE)					
8	MV ARENA II	FHILLIP STRAIT HEAVY RAIN SHORT VISIBILITY					
9	KM ARTHA 2	HINDIA OCEAN HEAVY WIND					
,	KM BENUA						
10	SANDAI GT 260	KARIMATA STRAIT, THE SHIP WAS BROKEN					
11	MT. TRIHASTA I	KARIMATA STRAIT, SHIP'S RUDDER OUT OF ORDER					
10	KLM. MUARAH						
12	AGUNG SURIA	ENGINE IROUBLE					
12	KM HADADAN	NORTH OF JAWA SEA, STORM AND THE PROPELLER					
15		WAS BROKEN					
14	KM. HASIL	IAVA SEA HEAVY WAVE					
	RAHMAT	JAVAJEA, HEAVI WAVE					
15	AMBULU	JAWA SEA, ENGINE TROUBLE					
16	RUKUN ISLAM	LAMAKERA;BAD WEATHER					
17	KM HARMONI	JAWA SEA ; ENGINE TROUBLE					
18	Kfe. AMBULU	JAWA SEA ; ENGINE TROUBLE					
19	PULAU MAS INDAH	JAWA SEA; THE CYLINDER OF SHIP WAS BROKEN					
20	TB. NELLY VII / TK	NATUNA SEA ; ENGINE TROUBLE					
21	NELLY II OCEAN ELVTE	LODAM SEA THE SHID WAS SUNK					
Ζ1		LUDAM SEA, THE SHIP WAS SUNK					
22	FYPRESS	LOMBOK STR, HEAVY WAVE					
23	TBANUGRAH	MANGGAR/BLITUNG KARANG&GOSONG					
20	KM SEPAKAT	NEAR P. BURUNG (KEPERAWATAN, SERIBU), THE					
24	INDAH	SHIP WAS SUNK					
05		WEST COASTAL OF NIAS & GAMUHE CAPE AFULU					
25	KM. PAN KURNIA	<b>STRAIT ; STORM &amp; HEAVY WAVE</b>					
24	MV SALINDO	EAST COASTAL OF KALIMANTAN; THE SHIP ENGINE					
∠0	PERDANA I	WAS ROBBERED					
27	TB. LIUS - I	EAST COASTAL OF KALIMANTAN ; ENGINE TROUBLE					
28	MV. SUNRISE	RIAU CHANNEL ATTACKEDEM PIRATES					
20	CRANE	MAC CHANNEL, AT FACKEDENT HATED					
29	KMP.PONCAN	GUNUNG SITOLI / PYLADES ISLAND, BAD WEATHER &					
۲7	MOALE	STORM					

No.	Name of Ship	Experience of The sea Disaster (Location & Causes)
30	LCT. BHAITA CATURTYA	SEA OF NATUNA,RAIN & FOG
31	TB. KP.PENISI	P.LAUT STRAIT SOUTH KALIMANTAN, THE NAVIGATION AID DIDN'T LIGHT
32	MV. ARENA II	PHILIP STRAIT, HEAVY RAIN & SUFFICIENT VISIBILITY
33	KLM SATRIA BAHARI	BALI STRAIT / THE MACHINE WAS BROKEN
34	KIJANG 3	GELASA STRAIT
35	KM PULAU SINGKEP	MADURA STRAIT; HUMAN ERROR
36	KM MANOKWARI	MAKASSAR STRAIT; HEAVY WAVE
37	ANGELIA XVI	SOUTH OF LAUT ISLAND , HUMAN ERROR
20	MV. MARINA	SENAYANG (MEDANG ISLANDS), HEAVY RAIN &
38	PERMAI	THICK FOG
39	KM PHINISI AMPASI	SERENGAN ISLANDS, BAD WEATHER
40	KM.MARINA PERMAI 88	SL.LIMA(PENUBA)
41	NONG GONG SHANG 8	SOUTH CHINA SEA
42	MT. NIAGA ENERGI	MUSI RIVER ; SHALLOW WATER
43	KM MUSDALIFAH	SUNGAI MUSI, THE ENGINE WAS BROKEN
44	KM. HARAPAN III	SURABAYA
45	FLORIA	TARJUN PORT, GROUNDING, BAD SOUNDING MAP
16	KMP.PONCAN	THE MIDDLE OF G.SITOLI/P.PYLADES WATERS, BAD
40	MOALEE	WEATHER (HEAVY RAIN & STORM)
47	MARINA INDAH 8	TG.PENGELIH(SEL.JOHOR)-BATU AMPAR; THE SHIP WAS LEAKED & BROKEN
48	MT. ISTANA VI	YELLOW SEA,PASSING FISHING BOAT GROUP (COLLITION)

### Appendix 8.2.1. Forecast of Marine Traffic for the Straits of Malacca and Singapore, Sea Lane I / II / III

#### 1. Basic Formula

In the **formula 8.2.8**., normally T is total cargo volume (tonnage) and total cargo volume (tonnage) is proportional to the number of passing vessel, so that **formula 1** should be applied to calculate the number of passing vessel. Also, GNP is used instead of GDP due to international trade.

 $T = a^* GNP^e$  (formula 1.)

Where

T : Number of passing vessels

**a** : Constant

GNP : Gross National Product

*e* : Elasticity coefficient

( elasticity hit between 0.8 to 2.0. It is usual that 0.8 is adequate for an industrialized country,  $1.0 \sim 2.0$  for developing country. 1.5 is fit for developing country, in this case 1.2 should be applied. )

From formula 1, formula 2. is introduced.

 $T_{n+1} = k^{e} * T_{n}$  (formula 2.)

Where

 $T_{n+1}$  : Number of passing vessels in year  $T_{n+1}$ 

*k* : Average GNP growth rate

*e* : Elasticity( in this case, 1.2)

 $T_n$  : Number of passing vessels in year  $T_n$ 

2. GNP Growth Rate

GNP growth rate is shown in **Table 1**. for the Straits of Malacca and Singapore, in **Table 2** for Sea Lane I / II / III.

#### Table 1. Economic Growth Rate

(World, %)

Voor	world
Teal	worrd
1990	3.3
1991	2.7
1992	3.3
1993	2.9
1994	4.7
1995	4
1996	4.4
1997	4.1
1998	2.3
1999	3.9
Average	3.5

Source: http://www.asean.or.jp/general/statistics/base05.html

# Table 2. Economic Growth Rate (Far East Asian Countries and Australia)

Units:%

	Year	China	Japan	Korea	Ta <b>i</b> wan	Aus tralia	Total
1	1985	16.2	4.4	6.5	5.0	4.3	7.3
2	1986	8.9	2.9	11.0	11.6	2.8	7.4
3	1987	11.6	4.2	11.0	12.7	5.4	9.0
4	1988	11.3	6.2	10.5	7.8	4.1	8.0
5	1989	4.1	4.8	6.1	8.2	3.7	5.4
6	1990	3.8	5.1	9.0	5.4	-0.2	4.6
7	1991	9.2	3.8	9.2	7.6	0.4	6.0
8	1992	14.2	1.0	5.4	7.5	3.7	6.4
9	1993	13.5	0.3	5.5	7.0	4.1	6.1
10	1994	12.7	0.6	8.3	7.1	4.5	6.6
11	1995	10.5	1.5	8.9	6.4	4.5	6.4
12	1996	9.5	5.0	6.8	6.1	3.8	6.2
13	1997	8.8	1.6	5.0	6.7	4.8	5.4
14	1998	-	-2.5	-6.7	4.6	4.6	0.0
15	1999	-	0.3	10.7	5.7	-	5.6
	Average	10.3	2.6	6.4	7.4	3.4	6.0

Source: Asian economy 2000, the Economic Planning Agency of Japan

# Table 3. Magnification of Traffic

Units:	Times
United.	1 mico

	emes. Thirds						
	Magnificati	on of traffic					
	Malacca/Singapo	Sea Lane , ,					
Year	re Straits						
2001	1.00	1.00					
2002	1.04	1.07					
2003	1.09	1.15					
2004	1.13	1.23					
2005	1.18	1.32					
2006	1.23	1.42					
2007	1.28	1.52					
2008	1.34	1.63					
2009	1.39	1.75					
2010	1.45	1.88					
2011	1.51	2.01					
2012	1.57	2.16					
2013	1.64	2.31					
2014	1.71	2.48					
2015	1.78	2.66					
2016	1.86	2.85					
2017	1.94	3.06					
2018	2.02	3.28					
2019	2.10	3.52					
2020	2.19	3.78					

-					0			1					
NO.	DSI No.	Location	DISNAV	Construction (Rehab.) Year	Age	Operation Status	Lantern Condition	Power Supply condition	Structure Condition	DUP	Latitude	Longitude	Remaks
1	10	Ie. Meule	Sabang	1974	27	1	0	0	0	1	05-53-54N	095-19-48	
2	11	Rondo	Sabang	1984	17	1	0	0	0	0	06-04-30N	095-06-50	
3	77	P. Bunta	Sabang	1980	21	1	0	0	0	0	05-33-20N	095-09-05	
4	84	Ujung Pidie	Sabang	1987	14	0	0	0	1	0	05-30-00N	095-53-00	
5	2931	Ujung Raja	Sabang	1988	13	0	0	0	1	0	03-44-20N	096-31-10	
6	2690	Temang	Sibolga	1971	30	1	1	1	0	0	00-22-00N	099-05-30	
7	2790	P. Sigata	Sibolga	1971	30	1	1	1	0	0	00-07-30S	098-12-00	
8	960	P.Berhala	Tg.Pinang	1978	23	1	0	0	0	1	00-52-30S	104-24-30	
9	1000	Tunjuk I	Tg.Pinang	1975	26	1	1	1	0	1	00-56-44N	104-12-10	
10	1110	Tunjuk II	Tg.Pinang	1975	26	1	1	1	0	1	01-13-10N	104-34-30	
11	2223	Tg.Sekatung	Tg.Pinang	1984	17	1	0	0	0	1	04-47-40N	108-01-14	
12	2000	P.Pesemut	Tg. Priok	1983	18	1	1	1	1	1	02-29-50S	108-50-33	Improvement for range
13	3070	Tegal I	Semarang	1983	18	0	0	0	0	0	06-51-08S	109-08-13	
14	3130	Tegal II	Semarang	1982	19	1	0	0	0	1	06-50-59S	109-08-17	
15	3271	P. Panjang	Semarang	1989	12	1	0	0	0	1	06-34-32S	110-37-26	
16	3290	P. Mandalika	Semarang	1886	115	1	0	0	0	1	06-23-00S	110-55-30	
17	3300	P. Nyamuk	Semarang	1980	21	1	0	0	0	1	05-48-51S	110-11-20	
18	3871	Pasuruan	Surabaya	1975	26	1	1	1	1	1	07-37-40S	112-55-17	Improvement for range (On
19	3900	Pel. Besuki	Surabaya	1975	26	1	1	1	1	1	07-43-30S	113-41-30	Improvement for range
20	4150	Buleleng	Benoa	1978	23	1	0	0	1	1	08-05-30S	115-05-30	
21	4170	Lembongan	Benoa	1974	27	1	1	1	0	1	08-40-00S	115-27-30	
22	4175	Sedihing	Benoa	1989	12	1	0	0	1	0	08-49-20S	115-35-42	
23	1980	Tg. Rotan	Pontianak	1991	10	1	0	0	0	0	02-40-50S	110-02-20	
24	2025	P. Pengiki	Pontianak	1982	19	1	1	1	0	1	00-14-46N	108-02-25	
25	4730	Tukong Hill	Samarinda	1980	21	1	1	1	0	1	01-16-30S	116-48-30	
26	4890	Tg.Mangkalihat	Samarinda	1972	29	1	1	1	1	1	00-59-29N	118-59-08	Improvement for height

Appendix 9.1.1. Condition of Equipment for Lighthouses with an Improper Operation Status
				Construction		Operation	Lanterr	Power Supply	Structure				
NO.	DSI No.	Location	DISNAV	(Rehab.) Year	Age	Status	Condition	condition	Condition	DUP	Latitude	Longitude	Remaks
27	5150	Sambit Pada	Tarakan	1989	12	1	0	0	1	0	01-46-30N	119-02-00	
28	5120	P.Tuguan	Manado/Bitung	1902 (1972)	29	1	1	1	1	0	00-35-00N	119-48-00	Improvement for height
29	5140	P.Salando	Manado/Bitung	1913 (1972)	29	1	1	1	1	0	01-20-30N	120-48-10	Improvement for range
30	5340	P.Hulawa	Manado/Bitung	1910 (1980)	21	1	1	1	1	0	00-58-20N	122-53-42	Improvement for range
31	5360	Gunung Wenang	Manado/Bitung	1896	105	1	1	1	1	0	01-29-40N	124-50-18	Improvement for height and
32	5365	P.Mayu	Manado/Bitung	1983	18	1	1	1	1	0	01-19-10N	126-21-32	Improvement for range
33	5390	Talisei	Manado/Bitung	1910	91	1	1	1	1	0	01-53-10N	125-05-40	Improvement for range
34	5441	Marore	Manado/Bitung	1983	18	1	1	1	1	0	04-44-30N	125-28-30	Improvement for range
35	5444	P.Miangas	Manado/Bitung	1977	24	1	1	1	0	0	05-33-46N	126-35-38	
36	5470	P.Pondang	Manado/Bitung	1912 (1980)	21	1	0	0	1	0	00-26-05N	124-28-30	
37	5490	Gorontalo	Manado/Bitung	1883 (1960)	41	1	0	0	0	0	00-29-39N	123-03-18	
38	4950	Tg.Bunga	Makassar	1980	21	1	0	0	0	1	05-09-00S	119-24-00	
39	4311	Tg. Sasar	Kupang	1988	13	0	0	0	0	0	09-16-50S	119-56-30	
40	5740	Menia	Kupang	1920 (1982)	19	1	1	1	0	0	10-26-00S	121-52-00	
41	5750	Ba'a	Kupang	1912 (1980)	21	1	0	0	0	0	10-43-30S	123-03-00	
42	5770	Kupang	Kupang	1921 (1981)	20	1	1	1	0	0	10-10-38S	123-34-30	
43	5800	Tg.kurung	Kupang	1912 (1974)	27	1	0	0	1	0	10-07-30S	123-26-30	
44	5830	Meaty Miarang	Kupang	1912 (1983)	18	1	1	1	1	0	08-20-00S	128-29-30	Improvement for height and
45	5870	Tanjung Ular	Ambon	1922	79	1	1	1	1	0	05-45-09S	134-10-40	Improvement for height and
46	5910	P.Suanggi	Ambon	1882	119	1	1	1	1	0	03-18-00S	127-28-00	Improvement for range
47	6454	Isyuma / P. Liki	Jayapura	1984	17	1	0	0	1	0	01-35-00S	138-43-05	
48	6190	Amsterdam Pu.Miossu	Sorong	1953	48	1	0	0	1	0	00-20-40S	132-10-20	
49	6205	P.Adi	Sorong	1981	20	0	0	0	0	1	04-18-50S	133-37-10	

Appendix 9.1.1. Condition of Equipment for Lighthouses with an Improper Operation Status

Note: "1" and "0" of Operation Status show "In Service (Good)" and "Out of Service", respectively

"1" and "0" for Conditions of Lantern, Power Supply and Structure show "Good" and "Damaged, Malfunction or Degrading"

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
1	150	Kuala Langsa	Belawan	1980	0	0	0	0	1	04-32-41N	098-03-02 E	
2	160	Kuala Langsa	Belawan	1980	0	0	0	0	1	04-33-08N	098-03-36 E	
3	180	Kuala Langsa	Belawan	1980	0	0	0	0	1	04-33-33N	098-04-22 E	
4	190	Kuala Langsa	Belawan	1980	0	0	0	0	1	04-33-01N	098-03-56 E	
5	390	Belawan Deli	Belawan	1983	0	0	0	0	1	03-48-54N	098-43-00 E	
6	400	Belawan Deli	Belawan	1983	0	0	0	0 (Collapsed)	1	03-48-06N	098-43-15 E	
7	410	Belawan Deli	Belawan	1983	1	0	0	1	1	03-47-22N	098-43-38 E	
8	450	Sungai Nunang	Belawan	1979	0	0	0	0 (Collapsed)	0	03-47-18N	098-40-46 E	
9	451	Sungai Nunang	Belawan	1984	0	0	0	0 (Collapsed)	0	03-47-30N	098-40-42 E	
10	510	Tg.Tiram	Belawan	1984	1	0	0	1	1	03-14-54N	099-35-19 E	
11	550	Bagan Asahan	Belawan	1977	1	0	0	1	1	03-02-46N	099-51-56 E	
12	551	S Asahan Depan	Belawan	1993	0	0	0	0 (Collapsed)	0	03-01-44N	099-51-40 E	
13	631	Morong	Dumai	1979	1	1	1	0	0	01-55-10N	101-46-25 E	
14	650	Tg.Leban	Dumai	1991	0	0	0	0	1	01-39-30N	101-50-30 E	
15	672	Tg. Padang Bengkalis strait	Dumai	*	0	0	0	0 (Collapsed)	1	01-24-55N	102-09-55 E	Improvement from bouy
16	674	Selat Rupat B	Dumai	1984	1	1	1	1	0	01-31-06N	101-55-12 E	
17	675	Selat Rupat C	Dumai	1984	1	0	0	1	0	01-32-14N	101-54-33 E	
18	677	Selat Rupat E	Dumai	1991	0	0	0	0	1	01-41-23N	101-48-09 E	
19	678	Selat Rupat F	Dumai	1981	1	1	1	1	1	01-41-30N	101-48-09 E	
20	679	Selat Rupat G	Dumai	1991	0	0	0	0	1	01-41-30N	101-47-53 E	
21	729	Sei.Siak	Dumai	*	0	0	0	0 (Collapsed)	1	01-14-11N	102-10-14 E	Improvement from bouy
22	740	Sei Siak	Dumai	1984	0	0	0	0 (Collapsed)	0	01-12-30N	102-10-00 E	
23	750	Sei Siak	Dumai	1961	0	0	0	0	0	01-11-30N	102-09-30 E	Improvement from bouy
24	751	Sei.Siak	Dumai	*	0	0	0	0 (Collapsed)	1	01-07-52N	102-09-31 E	Improvement from bouy

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
25	752	Sei.Siak	Dumai	*	0	0	0	0 (Collapsed)	1	01-07-52N	102-09-33 E	
26	852	Sekupang	Tg.Pinang	1980	1	1	1	1	0	01-08-52N	103-54-16 E	
27	868	Batu Ampar	Tg.Pinang	1979	1	1	1	1	1	01-09-41N	103-59-08 E	
28	921	Tg.Datuk	Dumai	*	0	0	0	0 (Collapsed)	1	00-00-44N	103-48-20 E	Improvement from bouy
29	928	Tg.Bakau	Dumai	1978	0	0	0	1	1	00-20-00S	103-47-30 E	
30	929	Tembilahan	Dumai	1982	1	1	1	0	0	00-20-00S	103-09-18 E	
31	940	Speck Rock	Tg.Pinang	1988	0	1	1	0	0	00-36-48N	104-06-06 E	
32	981	Mentigi	Tg.Pinang	1983	А	1	1	1	0	01-03-45N	104-13-00 E	
33	1010	Tunjuk II	Tg.Pinang	1975	1	1	1	0	0	00-56-26N	104-12-00 E	
34	1086	Tg.Maga	Tg.Pinang	1986	1	1	1	1	0	00-47-36N	104-35-07 E	
35	1087	P.Mantang	Tg.Pinang	1986	1	1	1	1	0	00-47-18N	104-34-52 E	
36	1088	P.Kambat	Tg.Pinang	1989	0	0	0	0 (Collapsed)	1	00-48-30N	104-39-54 E	
37	1112	Kr.Heluputan	Tg.Pinang	1992	0	0	0	0 (Collapsed)	0	00-37-15N	105-08-30 E	
38	1160	S. Daik	Tg.Pinang	1990	1	1	1	0	0	00-13-30N	104-78-00 E	
39	1170	Pelab. Penuba	Tg.Pinang	1990	1	1	1	0	0	00-19-10N	104-27-50 E	
40	1180	Pelab. Dabo	Tg.Pinang	1990	0	0	0	0 (Collapsed)	0	00-29-30S	104-33-30 E	
41	1190	P.Saya	Tg.Pinang	1994	0	0	0	0 (Collapsed)	0	00-46-50S	104-55-58 E	
42	1270	Hendrik	Palembang	1982	0	0	0	0	0	01-58-00S	104-57-10 E	
43	1271	Tg. Kampeh	Palembang	1980	0	0	0	0 (Collapsed)	0	02-11-27S	104-54-04 E	
44	1300	Bak I	Palembang	1996	1	0	0	0	1	02-13-11S	104-55-34 E	
45	1310	Bak II	Palembang	1981	0	0	0	0 (Collapsed)	1	02-12-50S	104-55-42 E	
46	1420	Kramat	Palembang	1976	1	1	1	1	1	02-31-18S	104-56-00 E	
47	1421	Singkris	Palembang	1976	1	1	1	1	0	02-34-18S	104-56-18 E	
48	1425	P. Ayam	Palembang	1976	1	1	1	1	1	02-40-03S	104-56-18 E	

### Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
49	1590	Tg. Selokan	Tg. Priok	1971	1	0	0	1	1	02-23-00S	105-37-00 E	
50	1682	Maspari	Tg. Priok	1986	0	0	0	0 (Collapsed)	0	03-13-08S	106-13-00 E	
51	1684	Tg. Menjangan	Tg. Priok	1995	0	0	0	1	0	03-49-14S	106-00-03 E	
52	1687	Tg. Bungin	Tg. Priok	1999	0	0	0	1	0	04-33-28S	106-03-29 E	
53	1689	Gs. Serdang	Tg. Priok	1994	0	0	0	1	0	05-04-30S	106-16-36 E	
54	1700	Beting Raja	Tg. Priok	1971	1	0	0	0	0	05-12-30S	106-44-20 E	
55	1708	Tg. Priok	Tg. Priok	1993	0	0	0	0 (Collapsed)	0	06-05-41S	106-52-40 E	
56	1710	Beting Eka	Tg. Priok	1972	0	0	0	0 (Collapsed)	1	05-17-32S	106-54-30 E	
57	1740	Tg. Kerawang	Tg. Priok	1979	0	0	0	0 (Collapsed)	1	05-54-18S	107-00-28 E	
58	1751	P. Putri	Tg. Priok	1983	0	0	0	0	0	06-04-07S	106-51-18 E	
59	1752	Kr. Lamteri	Tg. Priok	1983	0	0	0	0	0	06-04-25S	106-49-50 E	
60	1820	Pel. Pertamina	Tg. Priok	1982	0	0	0	0	0	06-05-49S	105-53-41 E	
61	1821	Pel. Pertamina	Tg. Priok	1982	0	0	0	0 (Collapsed)	0	06-05-38S	106-54-18 E	
62	1822	Pel. Pertamina	Tg. Priok	1982	0	0	0	0 (Collapsed)	0	06-05-51S	106-54-14 E	
63	1823	Pel. Pertamina	Tg. Priok	1985	0	0	0	0 (Collapsed)	0	06-05-40S	106-53-41 E	
64	1831	Kr. Belikat	Palembang	1995	0	0	0	1	0	02-28-00S	106-58-20 E	
65	1910	Tg. Pandang	Tg. Priok	1973	0	0	0	0 (Collapsed)	0	02-44-10S	107-35-42 E	
66	1911	Kr. Tanjung Pandan	Palembang	1993	0	0	0	0 (Collapsed)	0	02-43-58S	107-35-30 E	
67	1916	Magdalena	Palembang	1994	0	0	0	0 (Collapsed)	0	02-01-18S	106-32-24 E	
68	1923	Kr. Merah	Tg. Priok	1979	1	1	1	1	1	02-01-27S	106-15-26 E	
69	1950	Pangkal baran depan	Palembang	1979	0	0	0	0	0	02-05-40S	106-09-57 E	
70	1960	Gs. Mapango	Tg. Priok	1971	1	1	1	1	0	03-35-00S	109-10-00 E	
71	1970	Fox Bank	Tg. Priok	1989	1	0	0	1	1	03-30-40S	110-11-00 E	
72	2010	Kanis	Tg. Priok	1973	0	0	0	0 (Collapsed)	0	02-37-18S	108-12-20 E	

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
73	2037	S. Datu Belakang	Pontianak	1991	1	1	1	0	0	00-07-35S	108-36-40 E	
74	2041	Telok Air	Pontianak	1995	0	0	0	0 (Collapsed)	0	00-40-54S	109-22-10 E	
75	2042	Telok Air	Pontianak	1997	0	0	0	0 (Collapsed)	0	00-12-32S	109-23-50 E	
76	2043	Telok Air	Pontianak	1997	0	0	0	0 (Collapsed)	0	00-43-48S	109-27-11 E	
77	2044	Telok Air	Pontianak	1997	0	0	0	0 (Collapsed)	0	00-45-12S	109-25-50 E	
78	2045	Telok Air	Pontianak	1997	0	0	0	0 (Collapsed)	0	00-44-00S	109-32-55 E	
79	2068	Telok Air	Pontianak	1983	0	0	0	0 (Collapsed)	0	00-00-16N	109-18-04 E	
80	2075	Wajok hulu	Pontianak	1986	0	0	0	0 (Collapsed)	0	00-00-55N	109-16-45 E	
81	2076	Sei Serok	Pontianak	1986	1	0	0	0	0	00-00-10N	109-17-36 E	
82	2080	Lemanbudi	Pontianak	1986	0	0	0	0 (Collapsed)	0	01-16-20S	108-52-25 E	
83	2091	Sambas Belakang	Pontianak	1993	0	0	0	0 (Collapsed)	0	01-11-29N	108-59-02 E	
84	2132	Pemangkat	Pontianak	1977	0	0	0	0 (Collapsed)	0	01-11-52N	108-55-10 E	
85	2135	Panjang Ketapang	Pontianak	1983	1	1	1	0	0	01-45-51S	109-56-32 E	
86	2136	Panjang Ketapang Rear	Pontianak	1983	1	1	1	0	0	01-45-58S	109-56-40 E	
87	2138	Kerbau Ketapang	Pontianak	1985	1	1	1	0	0	01-45-31S	109-56-07 E	
88	2139	Kerbau Ketapang	Pontianak	1989	0	0	0	0 (Collapsed)	0	01-45-24S	109-56-03 E	
89	2143	Kr. P. Buan	Pontianak	1994	0	0	0	0 (Collapsed)	0	01-28-05S	109-03-00 E	
90	2180	Pel. Serasan	Tg.Pinang	1990	0	0	0	0	0	02-29-50N	109-00-43 E	
91	2201	Kr.Serval	Tg.Pinang	1988	0	0	0	0 (Collapsed)	0	03-04-30N	108-02-04 E	
92	2272	Merak Besar	Tg. Priok	1976	0	0	0	0 (Collapsed)	1	05-56-04S	105-59-31 E	
93	2310	Telk Betung	Tg. Priok	1971	1	0	0	1	1	05-28-00S	104-16-30 E	Improvement
94	2330	Teluk Betung	Tg. Priok	1971	1	0	0	1	0	05-28-03S	105-18-40 E	
95	2340	Teluk Betung	Tg. Priok	*	0	0	0	0 (Collapsed)	1	05-28-02S	105-18-45 E	Improvement from bouy
96	2381	Tg. Tua	Tg. Priok	1981	0	0	0	1	0	05-54-22S	105-43-00 E	

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
97	2420	Gs. Jong	Tg. Priok	1974	0	0	0	0	1	05-51-09S	106-38-44 E	
98	2430	Kroe	Tg. Priok	1971	0	0	0	0	0	05-11-00S	103-56-00 E	
99	2477	Malakoni	Tg. Priok	1993	0	0	0	0 (Collapsed)	0	05-20-26S	102-17-19 E	
100	2600	Bukit Tampak	Tlk. Bayur	1979	1	1	1	0	0	01-00-23S	100-22-52 E	
101	2671	Ujung Tiku	Tlk. Bayur	1982	1	0	0	0	0	00-25-28S	099-53-32 E	
102	2672	Kr. Ingaris	Tlk. Bayur	1990	1	0	0	0	0	00-29-10S	099-51-30 E	
103	2673	Gs. Moller	Tlk. Bayur	1990	0	0	0	0	1	00-04-20S	099-24-00 E	
104	2691	Uj.Marit	Sibolga	1990	0	0	0	0	0	00-00-56N	098-15-40 E	
105	2713	Natal	Sibolga	1983	1	1	1	0	0	00-33-00N	099-06-12 E	
106	2713.1	P. Unggas	Sibolga	1996	1	1	1	0	0	00-36-34N	099-03-10 E	
107	6	P.Sidakah	Sibolga	1984	0	0	0	0	1	00-51-34N	098-56-18 E	
108	2730	Ujung Silabi	Sibolga	1987	1	1	1	0	0	02-01-41N	098-15-35 E	
109	2735	P. Bintana	Sibolga	1993	0	0	0	0	0	01-28-35N	098-10-20 E	
110	2760	P. Baleh	Sibolga	1984	1	0	0	0	0	02-17-36N	097-24-12 E	
111	2761	Kr. Panjang	Sibolga	1976	1	0	0	0	0	02-16-46N	097-23-23 E	
112	2770	Batu Makele	Sibolga	1979	1	1	1	0	0	00-03-18S	098-17-29 E	
113	2780	Batu Makele	Sibolga	1979	1	1	1	0	0	00-03-40S	098-17-36 E	
114	2791	Gs.Ular	Sibolga	1984	1	1	1	0	0	00-05-10N	098-56-55 E	
115	2800	P.Tello	Sibolga	1979	1	1	1	0	0	00-03-08S	098-16-48 E	
116	2820	P.Hinako	Sibolga	1981	1	1	1	0	0	00-52-38N	097-20-36 E	
117	2831	Gn.Sitoli	Sibolga	1984	1	1	1	0	0	01-18-12N	097-36-12 E	
118	2834	Gs.Oma Lehawa	Sibolga	1986	1	1	1	0	0	01-28-00N	097-12-10 E	
119	2840	Sikabaluan	Tlk. Bayur	*	0	0	0	0 (Collapsed)	1	01-07-18N	098-59-42 E	
120	2850	Gs.Baohi Lahewa	Sibolga	1981	0	0	0	0	1	01-26-05N	097-10-10 E	

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
121	2855	P. Sumbawqa	Sibolga	1992	0	0	0	0	0	00-54-26N	098-00-48 E	
122	2870	Tg.Hele	Sibolga	1974	0	0	0	0	1	00-32-40N	097-49-17 E	
123	2881	Krueng Rangsa Sinabang	Sabang	1976	1	1	1	0	0	02-31-44N	096-23-56 E	
124	2960	P. Rusa	Sabang	1978	1	0	0	0	0	05-16-40N	095-12-00 E	
125	3030	Dam Timur	Tg. Priok	1970	1	1	1	1	0	06-42-22S	108-34-36 E	
126	3040	Dam Barat	Tg. Priok	1970	1	1	1	1	0	06-42-16S	108-34-34 E	
127	3062	Tg. Sengarong	Tg. Priok	1980	0	0	0	0	0	06-45-20S	108-49-10 E	
128	3080	Tegal	Semarang	1982	1	1	1	0	0	06-50-40S	109-08-06 E	
129	3090	Trgal	Semarang	1979	1	1	1	0	0	06-50-43S	109-08-08 E	
130	3100	Tegal	Semarang	1979	1	1	1	0	0	06-50-51S	109-08-10 E	
131	3160	Pekolomgan	Semarang	1984	1	1	1	0	0	06-51-26S	109-41-30 E	
132	3180	Batanta	Semarang	1989	1	1	1	0	0	06-51-20S	109-41-34 E	
133	3270	Jepara	Semarang	1984	1	1	1	0	0	06-35-04S	110-39-20 E	
134	3273	Alur Ma. Pel. Juana	Semarang	1991	0	0	0	0 (Collapsed)	1	06-39-00S	111-10-00 E	
135	3275	Juwana	Semarang	1990	0	0	0	0	1	06-39-05S	111-10-30 E	
136	3276	Juana	Semarang	1990	0	0	0	0	1	06-40-15S	111-10-30 E	
137	3277	Alur Ma. Pel. Juana	Semarang	1991	0	0	0	0 (Collapsed)	0	06-40-18S	111-10-42 E	
138	3278	Alur Ma. Pel. Juana	Semarang	1991	0	0	0	0 (Collapsed)	0	06-40-35S	111-10-29 E	Improvement
139	3293	Tg. Pudak	Semarang	1986	0	0	0	0	0	05-53-21S	110-26-52 E	
140	3608	Keramaian	Surabaya	1984	1	1	1	0	1	05-02-30S	114-37-00 E	
141	3920	Pel. Panarukan	Surabaya	1971	1	0	0	1	0	07-42-00S	113-55-30 E	Improvement
142	3980	Pel. Kalianget	Surabaya	1968	1	1	1	1	0	07-03-30S	113-56-00 E	
143	3990	Pel. Kalianget	Surabaya	1968	1	1	1	1	0	07-03-00S	113-56-18 E	
144	3991	Pel. Kalianget	Surabaya	1968	1	1	1	1	0	07-03-26S	113-56-34 E	

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
145	3992	Pel. Kalianget	Surabaya	1968	1	1	1	1	0	07-03-24S	113-56-36 E	
146	4070	Tg. Pasir	Benoa	1971	1	1	1	0	0	08-05-50S	114-26-05 E	
147	4122	Kr. Wuni Wates	Cilacap	1991	0	0	0	0	1	07-55-42S	110-06-16 E	
148	4125	Tg. Sodong NK	Cilacap	1981	1	1	1	0	0	07-44-33S	108-59-21 E	
149	4167	Tg. Sari	Benoa	1976	0	0	0	0	1	08-31-43S	115-30-17 E	
150	4185	Keramat Lebar	Benoa	1986	1	1	1	0	0	08-44-22S	116-03-40 E	
151	4190	Gendang	Benoa	1992	0	0	0	0	0	08-45-06S	115-49-12 E	
152	4200	Petagan	Benoa	1981	1	1	1	0	1	08-26-05S	116-45-17 E	
153	4201	Sekunci	Benoa	1984	0	0	0	0	1	07-51-30S	117-12-30 E	
154	4220	Tg. Mankun	Benoa	1994	0	0	0	0	1	09-00-38S	116-43-52 E	
155	4310	Waingapu	Kupang	1981	1	1	1	0	0	09-38-02S	120-15-25 E	
156	4331	Lawandau Kotawaringin	Banjarmasin	1987	0	0	0	0	0	02-55-25S	111-23-00 E	
157	4336	Tg. Keluang	Banjarmasin	1990	1	0	0	0	0	02-54-15S	111-42-11 E	
158	4337	Tg. Serambut	Banjarmasin	1987	1	0	0	0 (Collapsed)	1	02-59-11S	113-03-12 E	
159	4338	Tg. Serambut	Banjarmasin	1986	0	0	0	0 (Collapsed)	1	02-59-24S	113-03-12 E	
160	4468	Gosong Keramat	Banjarmasin	1993	0	0	0	1	0	03-32-06S	116-00-20 E	
161	4630	Karang Suling	Samarinda	1990	1	1	1	0	0	02-22-30S	116-43-31 E	
162	4640	Aru Bank	Samarinda	1990	1	1	1	0	0	02-15-31S	116-40-00 E	
163	4641	Telk Apar	Samarinda	1985	0	0	0	0	0	02-02-42S	116-33-00 E	
164	4645	Teluk Adang	Samarinda	1983	0	0	0	0	0	01-45-00S	116-28-20 E	
165	4658	P. Seturian	Samarinda	1991	0	0	0	0	0	02-16-20S	117-39-40 E	
166	4731	Balikpapan	Samarinda	1990	0	0	0	0	0	01-13-32S	116-48-20 E	
167	4748	Tg. Nibung	Samarinda	1982	0	0	0	0 (Collapsed)	0	00-48-30S	117-17-51 E	
168	4749	Tg. Nibung	Samarinda	1982	0	0	0	0	0	00-48-06S	117-17-45 E	

### Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
169	4762	S. Marian	Samarinda	1984	1	1	1	0	0	00-34-54S	117-16-36 E	
170	4763	Kutai River	Samarinda	1990	0	0	0	0 (Collapsed)	0	00-34-20S	117-16-20 E	
171	4768	Mahakam River	Samarinda	1990	0	0	0	0 (Collapsed)	0	00-20-15S	117-29-42 E	
172	4911	Sibald Bank	Makassar	1994	0	0	0	0 (Collapsed)	1	05-46-00S	117-07-00 E	
173	4921	P. Tnakeke	Makassar	1985	1	0	0	1	0	05-29-36S	119-19-08 E	Improvement
174	4990	Samalona	Makassar	1982	1	0	0	1	0	05-07-30S	119-20-20 E	Improvement
175	5011	Bone Panambungan	Makassar	1984	1	0	0	1	0	04-58-00S	119-21-20 E	Improvement
176	5012	Batu Nombongan	Makassar	1985	0	0	0	0 (Collapsed)	0	04-52-45S	119-22-00 E	
177	5021	Pangka Mandra	Makassar	1991	1	1	1	1	0	04-16-40S	119-17-30 E	
178	5042	Awerrange	Manado/Bitung	*	1	0	0	1	0	04-13-55S	119-36-00 E	Improvement
179	5043	Awerrange	Manado/Bitung	*	1	0	0	1	0	04-13-55S	119-35-50 E	Improvement
180	5112	Pel. Pantoloan	Manado/Bitung	1978	1	0	0	1	0	00-42-12S	119-51-03 E	Improvement
181	5160	Kr.Malalungun	Tarakan	1985	1	1	1	0	1	01-55-32N	118-26-40 E	
182	5164	Muara pantai	Tarakan	1990	1	1	1	0	0	02-01-50N	117-51-18 E	
183	5172	P. Pajang	Tarakan	1990	1	1	1	0	0	02-23-00N	118-12-10 E	
184	5176	Tg.Ulingan	Tarakan	1992	0	0	0	0	1	02-12-08N	118-02-40 E	
185	5311	Gs. Makassar Nunukan	Tarakan	1991	1	0	0	1	0	03-59-29N	117-56-58 E	Improvement
186	5312	Tg.Harapan	Tarakan	1991	1	1	1	0	1	04-03-30N	117-45-05 E	
187	5315	Tg. Ahus	Tarakan	1991	1	0	0	1	0	03-46-10N	117-56-39 E	Improvement
188	5320	Pel.Leok	Manado/Bitung	1994	1	0	0	1	0	01-11-40N	121-25-40 E	Improvement
189	5351	Pel.Inobonto	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	00-55-30N	124-06-00 E	
190	5410	Pel.Tagulandang	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	02-20-30N	125-23-00 E	
191	5440	Pel.Peta	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	03-39-30N	125-32-30 E	
192	5454	Tg. Batuangus, Selat Lembeh	Manado/Bitung	1982	1	1	1	0	0	01-30-18N	125-14-53 E	

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
193	5468	Pel.Belang	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	00-56-00N	124-47-00 E	
194	5469	Pel.Kotabunan	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	00-47-50N	124-38-31 E	
195	5492	Pel.Tilamuta	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	00-30-00N	122-20-11 E	
196	5495	Pel.Moutong	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	00-27-20N	121-13-30 E	
197	5520	Pel. Poso	Manado/Bitung	1990	1	0	0	1	0	01-22-00S	120-45-00 E	Improvement
198	5530	Walea	Manado/Bitung	1991	1	0	0	1	1	00-25-00S	122-25-30 E	Improvement
199	5540	Pel.Una-Una	Manado/Bitung	*	0	0	0	0 (Collapsed)	0	00-08-00S	121-39-00 E	
200	5549	Alur masuk Pel.Luwuk	Manado/Bitung	1994	1	1	1	0	0	00-57-03S	122-47-34 E	
201	5551	Tg.Montok	Manado/Bitung	1998	1	0	0	0	0	01-13-50S	123-15-03 E	Improvement
202	5552	Lamobuang/Salakan	Manado/Bitung	1998	1	0	0	1	0	01-18-10S	123-17-59 E	Improvement
203	5557	Kg.Bekakang	Manado/Bitung	1995	1	1	1	0	0	01-35-06S	123-27-30 E	
204	5558	Karang Kenau	Manado/Bitung	1995	1	1	1	0	0	01-46-22S	123-31-40 E	
205	5571	P. Batu Tenggara	Manado/Bitung	1977	1	1	1	0	0	01-56-15S	121-22-00 E	
206	5573	Tg.Mposo	Manado/Bitung	1977	1	0	0	0	0	01-57-00S	121-32-30 E	Improvement
207	5578	Bunk toko	Kendari	1977	0	0	0	0 (Collapsed)	0	03-58-24S	122-36-23 E	
208	5579	Saponda	Kendari	1984	1	0	0	1	0	03-58-24S	122-46-00 E	Improvement
209	5581	Sappa Jambi	Kendari	1982	1	0	0	0	0	03-58-30S	122-40-25 E	Improvement
210	5582	Tanjun Kendari	Kendari	1977	1	1	1	0	0	03-58-50S	122-35-56 E	
211	5583	Twelling Barat	Kendari	1992	0	0	0	0 (Collapsed)	0	04-12-54S	122-55-00 E	
212	5584	Tweiling Timur	Kendari	1983	1	1	1	0	0	04-12-46S	122-56-10 E	
213	5600	Krg.Raha	Kendari	1983	1	0	0	1	0	04-50-50S	122-44-20 E	
214	5614	P.Siompu	Kendari	1985	0	0	0	0 (Collapsed)	1	05-41-30S	122-27-40 E	
215	5673	Padamarang	Kendari	1978	1	0	0	0	0	04-03-20S	121-22-48 E	
216	5682	Gosong Boni	Kupang	1995	1	0	0	1	0	08-23-22S	122-14-05 E	Improvement

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
217	5711	P.Lowotobi	Kupang	1982	1	0	0	1	0	08-36-12S	122-50-44 E	Improvement
218	5712	P.Sarbete	Kupang	1982	1	0	0	1	0	08-09-02S	123-01-10 E	Improvement
219	5720	Pel.Kalabahi	Kupang	1980	1	0	0	1	0	08-13-00S	124-31-00 E	Improvement
220	5811	Pel.Atapupu	Kupang	1982	1	0	0	1	0	08-59-42S	124-51-36 E	Improvement
221	5851	Waitidal	Ambon	1981	0	0	0	0 (Collapsed)	0	07-07-25S	131-43-14 E	
222	5861	Asatubun	Ambon	1981	1	0	0	0	0	08-03-30S	131-16-18 E	
223	5882	Pel. Tual	Ambon	1976	1	0	0	1	0	05-38-27S	132-44-12 E	Improvement
224	5884	P.Ubur	Ambon	1982	1	1	1	0	0	05-35-55S	132-43-47 E	
225	5886	Pel. Tual	Ambon	1978	0	0	0	0	0	05-34-10S	132-40-16 E	Improvement
226	5915	Kr.Dododahohe	Ambon	1988	0	0	0	0 (Collapsed)	1	01-59-05S	128-12-36 E	
227	5959	Batu Sarip	Ambon	1982	1	1	1	0	0	04-30-11S	129-53-03 E	
228	5974	Daruba	Ambon	*	0	0	0	1	0	02-35-55N	128-17-05 E	
229	5980	Hatilang	Ambon	1978	0	0	0	0	0	02-47-20S	129-29-30 E	Improvement
230	6005	Tg. Yatung	Merauke	1981	0	0	0	0	0	08-26-53S	140-18-26 E	
231	6008	Merauke	Merauke	1992	0	0	0	0 (Collapsed)	0	08-28-36S	140-21-07 E	
232	6020	Ujung Digul	Merauke	1991	0	0	0	0	1	06-55-58S	138-31-47 E	
233	6046	Ma.Keakwa	Sorong	1985	0	0	0	0	1	04-45-21S	136-30-31 E	Improvement
234	6060	Pel.Fakfak	Sorong	1989	0	0	0	0 (Collapsed)	0	02-56-16S	132-17-40 E	
235	6160	Kr.Membok	Sorong	1980	0	0	0	0	1	01-24-25S	130-54-40 E	
236	6180	Rasi	Jayapura	1982	1	1	1	0	0	01-20-30S	136-37-30 E	
237	6200	Saokorem	Sorong	1984	0	0	0	0	0	00-33-05S	133-09-00 E	
238	6240	Kaironyel	Sorong	1948	1	0	0	1	0	01-14-12S	131-06-42 E	Improvement
239	6250	Segeran	Sorong	1948	0	0	0	1	0	01-10-13S	131-06-42 E	Improvement
240	6260	Unasinim	Sorong	1949	0	0	0	1	0	01-11-23S	131-06-48 E	Improvement

### Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Ser. No.	DSI No.	Location	DISNAV	Constructi on Year	Operation Status	Lantern Condition	Power Supply Condition	Structure Condition	DUP	Latitude	Longitude	Remarks
241	6280	Balbili	Sorong	1948	0	0	0	0	1	01-05-30S	131-11-00 E	
242	6321	Karang Dua	Sorong	1983	1	0	0	0	0	00-53-36S	131-15-30 E	Improvement
243	6351	Doom	Sorong	1982	1	0	0	0	0	00-53-18S	131-14-04 E	
244	6390	Batanta	Sorong	1948	1	0	0	1	0	00-54-36S	130-36-30 E	
245	6409	P.Rani	Jayapura	1984	1	1	1	0	1	00-57-51S	135-30-17 E	
246	6445	P.Naufi	Jayapura	1994	1	0	0	1	1	02-14-10S	136-15-10 E	Improvement
247	132005	Rambu suar	Pontianak	1994	0	0	0	0 (Collapsed)	0	00-51-00N	107-37-06 E	
248	132006	Rambu suar	Pontianak	1994	0	0	0	0 (Collapsed)	0	00-45-03N	107-19-200 E	

Appendix 9.1.2 Condition of Equuipment for Light Beacons with an Improper Operation Status

Note:

"1" and "0" of Operation Status show "In Service (Good)" and "Out of Service", respectively "1" and "0" for Conditions of Lantern, Power Supply and Structure show "Good" and "Damaged, Malfunction or Degrading"

NO.	DSI NO.	Location	DISNAV	construction year	Operation Status	Lantern Condition	Power Supply condition	Structure Condition	dup	Latitude	Longitude	Remarks
1	82	Krueng Raya	Sabang	1983	1	1	1	0	0	05-36-55 N	095-31-12 E	
2	320	Belawan Deli Alur Masuk	Belawan	1971	0	0	0	0	0	03-58-10 N	098-47-30 E	
3	641	Pelsu No1. Selat Bengkalis	Dumai	1969	1	1	1	0	0	01-45-42 N	101-51-08 E	
4	651	Pelsu No.5 Selat Bengkalis	Dumai	1994	1	1	1	0	1	01-35-46 N	101-54-30 E	
5	693	Pelsu No.8 Selat Rupat	Dumai	1995	1	1	1	0	1	01-34-21 N	101-54-12 E	
6	702	Pelsu No.18 Selat Rupat	Dumai	1996	0	0	0	0	0	01-40-00 N	101-37-48 E	
7	720	Pelsu Selat Rupat	Dumai	1994	0	0	0	0	0	01-42-27 N	101-27-47 E	
8	722	Pelsu MPMT Sei Pakning	Dumai	1995	0	0	0	0	0	01-20-50 N	102-10-09 E	
9	723	Pelsu Sei Pakning	Dumai	1995	1	0	0	0	0	01-18-45 N	102-10-55 E	
10	729	Pelsu Sei Siak	Dumai	1995	0	0	0	0	0	01-14-11 N	102-10-14 E	
11	752	Pelsu P.Tengah Sei Siak	Dumai	1996	0	0	0	0	0	01-07-52 N	102-09-33 E	
12	862	Pelsu Batu Ampar	Tg. Pinang	1991	0	1	1	0	1	01-10-12 N	103-59-19 E	
13	926	Pelsu MPMT Kuala Kijang	Dumai	1997	0	0	0	0	1	00-43-50 S	103-36-00 E	
14	1200	Sungai Jambi	Palembang	1980	0	0	0	0	0	00-54-35 S	103-47-30 E	
15	1205	SungaiJambi (No.6)	Palembang	1980	1	0	0	0	0	01-00-12 S	103-48-37 E	
16	1290	Katung	Palembang	1976	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	02-10-50 S	104-58-16 E	
17	1350	Carat	Palembang	1976	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	02-15-51 S	104-55-19 E	
18	1351	S. Palembang sebelah Timur Sungai	Palembang	1976	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	02-18-04 S	104-55-14 E	
19	1370	Tg Gede	Palembang	1976	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	02-20-48 S	104-54-59 E	
20	1400	Selatan Payang	Palembang	1976	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	02-25-39 S	104-55-47 E	
21	1712	Pulau Bulat	Tg. Priok	1987	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	05-37-33 S	106-36-20 E	
22	1721	Tanjung Priok	Tg. Priok	1993	0	0 (Missing)	0	0	1	05-56-39 S	106-48-51 E	
23	1722	Tanjung Priok	Tg. Priok	1993	0	0 (Missing)	0	0	1	06-00-24 S	106-48-51 E	

### Appendix 9.1.3. Condition of Equipment for Light Buoys with an Improper Operation Status

Appendix 9-1-3-1

NO.	DSI NO.	Location	DISNAV	construction year	Operation Status	Lantern Condition	Power Supply condition	Structure Condition	dup	Latitude	Longitude	Remarks
24	1824	Pelita Bahari	Tg. Priok	1990	0	0 (Missing)	0	0	1	06-05-50 S	106-54-46 E	
25	2030	MPMT Ambang Luar	Pontianak	1993	0	0	0	0	0	00-38-58 S	109-05-00 E	
26	2131	Pelsu Pemangkat	Pontianak	1992	0	0 (Broken)	0 (Broken)	0 (Broken)	1	01-12-04 N	108-52-40 E	
27	2134	Ma. Kuala Panjang Ketapang	Pontianak	1996	0	0 (Broken)	0 (Broken)	0 (Broken)	1	01-44-38 S	109-53-50 E	
28	2988	Delta Doray	Tg. Pinang	1970	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	06-08-30 S	108-25-50 E	
29	3119	Tegal	Semarang	1990	1	1	1	0	0	06-40-54 S	109-08-08 E	
30	3140	Pelampung suar Pemalang	Semarang	1990	1	1	1	0	0	06-45-00 S	109-26-05 E	
31	3190	Pelampung suar Kolowelang	Semarang	1970	0 (Missing)	0 (Missing)	0 (Missing)	0	0	06-48-34 S	110-10-00 E	
32	3203	Semarang Tg. Mas (No.1)	Semarang	1984	1	1	1	0	0	06-54-58 S	110-24-59 E	
33	3204	Semarang Tg. Mas	Semarang	1985	0 (Sunken)	0 (Sunken)	0 (Sunken)	0	0	06-55-00 S	110-25-06 E	
34	3205	Semarang Tg. Mas	Semarang	1985	0 (Sunken)	0 (Sunken)	0 (Sunken)	0	0	06-55-36 S	110-25-02 E	
35	3206	Semarang Tg. Mas	Semarang	1985	0	1	0	0	0	06-55-36 S	110-25-07 E	
36	3207	Semarang Tg. Mas	Semarang	1985	0	1	0	0	0	06-55-54 S	110-25-02 E	
37	3208	Semarang Tg. Mas (No.6)	Semarang	1984	1	1	1	0	0	06-55-54 S	110-25-08 E	
38	3209	Semarang Tg. Mas	Semarang	1984	1	1	1	0	0	06-56-47 S	110-25-11 E	
39	3260	Pelampung suar Tg. Emas	Semarang	1994	1	1	1	0	0	06-52-00 S	110-24-54 E	
40	3291	Pelampung suar Pemalang	Semarang	*	0 (Sunken)	0 (Sunken)	0 (Sunken)	0 (Sunken)	1	06-33-12 S	111-16-12 E	
41	4088	Pelsu N0.8 Alur Benoa	Benoa	1983	0	0	0	0	0	08-44-59 S	115-12-48 E	
42	4341	Pelsu Merah ( Gs. Malang )	Banjarmasin	1985	0 (Sunken)	0 (Sunken)	0 (Sunken)	0 (Sunken)	1	03-06-50 S	113-05-00 E	
43	4363	Sungai Barito (No.2)	Banjarmasin	1983	0 (Sunken)	0 (Sunken)	0 (Sunken)	0 (Sunken)	1	03-36-42 S	114-27-07 E	
44	4364	Sungai Barito (No.3)	Banjarmasin	1994	0 (Sunken)	0 (Sunken)	0 (Sunken)	0 (Sunken)	1	03-36-10 S	114-27-29 E	
45	4365	Sungai Barito (No.4)	Sungai Barito (No.4) Banjarmasin 1994 0 (Sunken) 0 (Sunker)		0 (Sunken)	0 (Sunken)	0 (Sunken)	1	03-35-21 S	114-27-51 E		
46	4367	Sungai Barito (No.6) Banjarmasin 1994 0 (Missing) 0 (Missing)		0 (Missing)	0 (Missing)	1	03-33-36 S	114-28-50 E				

### Appendix 9.1.3. Condition of Equipment for Light Buoys with an Improper Operation Status

Appendix 9-1-3-2

NO.	DSI NO.	Location	DISNAV	construction year	Operation Status	Lantern Condition	Power Supply condition	Structure Condition	dup	Latitude	Longitude	Remarks
47	4371	Pelsu No. 7 Sei Barito	Banjarmasin	*	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	03-29-48 S	114-30-11 E	
48	4430	Sungai Kahayan	Banjarmasin	1980	0 (Missing)	0 (Missing)	0 (Missing)	0 (Missing)	1	03-27-00 S	114-05-39 E	
49	4431	Sungai Kahayan (No.2)	Banjarmasin	1980	0	0	0	0	0	03-23-00 S	114-05-39 E	
50	4754	Kutai River (Ma. Pegah)	Samarinda	1987	0	0	0	0	0	00-58-03 S	117-19-10 E	
51	4756	Kutai River (Ma. Pegah)	Samarinda	1987	0	0	0	0	0	00-54-29 S	117-18-20 E	
52	4870.1	Rending Island / S. Sanekuling	Samarinda	1987	0	0	0	0	0	00-52-36 N	118-02-28 E	
53	5113	Pantoloan	Manado/Bitung	1993	0	0	0	0	0	00-42-15 S	119-51-00 E	
54	5165	Sungai Berau	Tarakan	1976	0	0	0	0	0	01-56-00 N	118-05-30 E	
55	6004	Merauke Sungai Merauke	Merauke	1996	0	0	0	0	0	08-35-00 S	140-11-18 E	
56	6007	Merauke	Merauke	1996	0	0	0	0	0	08-31-43 S	140-18-55 E	
57	6011	De Jong's Punt di muara sungai	Merauke	1996	0	0	0	0	0	07-08-00 S	138-32-12 E	
58	6030	Sungai Flamingo	Merauke	1992	0	0	0	0	0	05-40-00 S	137-56-54 E	
59	6100	Pelsu S. Wasian	Sorong	1997	0	0	0	0	0	02-15-12 S	132-32-20 E	
60	6121	Ma. S. Kaikus	Sorong	1977	0	0	0	0	0	04-44-30 S	131-37-50 E	
61	83002	Tg Tanah	Tg. Priok	*	0	0	0	0	0	06-31-36 S	108-43-30 E	

#### Appendix 9.1.3. Condition of Equipment for Light Buoys with an Improper Operation Status

Note: "1" and "0" of Operation Status show "In Service (Good)" and "Out of Service", respectively "1" and "0" for Conditions of Lantern, Power Supply and Structure show "Good" and "Damaged, Malfunction or Degrading"

No.	No. (DSI)	Racon Code	Name of Lights	Lat	Long	Operation Status	Type of ATN	Structure	ATN Office
1	10	М	Iee Meulee	05-53-54 N	095-19-48 E	0	Lighthouse	Steel Lattice Tower	Sabang
2	120	К	Tg. Jambo Aye Diamont punt	05-14-51 N	097-29-17 E	0	Lighthouse	Steel Lattice Tower	Belawan
3	315	Ν	Nipah Larangan	03-54-14 N	098-40-37 E	0	Lighthouse	Steel Lattice Tower	Belawan
4	341	М	Belawan Deli	03-52-19 N	098-44-13 E	0	Light Beacon	Collapsed	Belawan
5	650	D	Ramsu Tg. Leban	01-39-30 N	101-50-30 E	0	Light Beacon	Steel Lattice Tower	Dumai
6	820	Ν	Rambu suar Nipa	01-09-12 N	103-39-24 E	0	Light Beacon	Steel lattice tower	Tg. Pinang
7	834	К	Rambu suar Karang Banteng	01-09-54 N	103-48-48 E	0	Light Beacon	GRP	Tg. Pinang
8	835	х	Rambu suar Helen Mars	01-07-24 N	103-46-30 E	0	Light Beacon	Steel lattice tower	Tg. Pinang
9	840	В	Rambu suar Batu Berhenti	01-11-07 N	103-53-00 E	0	Light Beacon	GRP	Tg. Pinang
10	865	В	Rambu suar Batu Ampar no.5	01-10-00 N	104-00-06 E	0	Light Beacon	Steel lattice tower	Tg. Pinang
11	930	М	Menara Suar Muci	00-32-30 S	104-01-40 E	0	Lighthouse	Steel Lattice Tower	Tg. Pinang
12	1310	М	Sungai Palembang	02-12-50 S	104-55-42 E	0	Light Beacon	Steel Lattice Tower	Palembang
13	1650	G	Toboali	03-00-52 S	106-26-53 E	0	Light Beacon	Steel Lattice Tower	Tg. Priok
14	1660	D	LH Dapur	03-08-00 S	106-31-00 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
15	1700	В	Beting Raja (Amemuiden droogte)	05-12-30 S	106-44-20 E	0	Light Beacon	Steel Lattice Tower	Tg. Priok
16	1710	В	Beting Eka (Etnadroogte)	05-17-32 S	106-54-30 E	0	Light Beacon	Steel Lattice Tower	Tg. Priok
17	1711	К	Peniki	05-41-40 S	106-42-43 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
18	1720	D	Damar Besar	05-57-30 S	106-50-30 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
19	1860	0	LH Simedang	03-19-00 S	107-37-30 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
20	1861	К	Kasenga	03-02-42 S	107-20-48 E	0	Light Beacon	Steel Lattice Tower	Tg. Priok
21	1880	К	Langkuas	02-32-00 S	107-37-30 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
22	1940	D	General Euot	02-04-00 S	106-19-00 E	0	Light Beacon	Steel Lattice Tower	Tg. Priok
23	1960	*	Discovery East Bank Gosong Manpangodi Gosong	03-35-00 S	109-10-00 E	0	Light Beacon	Steel Lattice Tower	Tg. Priok
24	2000	G	P. Pasemut	02-29-50 S	108-50-33 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
25	2020	Т	Serutu	01-43-00 S	108-42-00 E	0	Lighthouse	Steel Frame	Tg. Priok
26	2040	К	Ramsu Kapuas Kecil Depan	00-04-21 N	109-10-13 E	0	Light Beacon	Steel Lattice Tower	Pontianak
27	2150	К	Menara suar St. Petrus	01-54-00 N	108-39-00 E	0	Lighthouse	Steel Lattice Tower	Tg. Pinang
28	2230	G	Tg. Layar	06-45-00 S	105-12-30 E	0	Lighthouse	Steel Lattice Tower	Tg. Priok
29	2280	Т	Tempurung	05-54-03 S	105-55-45 E	0	Lighthouse	Steel Frame	Tg. Priok
30	2290	В	Belimbing	05-55-30 S	104-33-30 E	0	Lighthouse	Steel Frame	Tg. Priok
31	2490	Т	Tikus	03-50-30 S	102-11-00 E	0	Lighthouse	Steel Frame	Tg. Priok
32	2570	М	Mensu. Os. Beramas	01-02-30 S	100-22-30 E	0	Lighthouse	Concrete Tower	Telk Bayur
33	2580	М	Ramsu Laut Marlbrough	01-02-08 S	100-20-04 E	0	Light Beacon	Steel Lattice Tower	Telk Bayur
34	2990	Т	P Boompies, P. Rakit	05-56-16 S	108-22-58 E	0	Lighthouse	Steel Frame	Tg. Priok
35	3020	G	Cirebon	06-43-00 S	108-34-30 E	0	Lighthouse	Steel Latice Tower	Tg. Priok

No.	No. (DSI)	Racon Code	Name of Lights	Lat	Long	Operation Status	Type of ATN	Structure	ATN Office
36	3290	K	Menara suar P. Mandalika	06-23-00 S	110-55-30 E	1	Lighthouse	Steel Lattice Tower	Semarang
37	3400	К	Karang Jamuang	06-55-35	112-43-42 E	0	Lighthouse	Steel Lattice Tower	Surabaya
38	3600	М	Masalembo Besar	05-34-00 S	114-27-00 E	0	Lighthouse	Steel Latice Tower	Surabaya
39	4100	К	Mensu PP Cimiring N.K	07-46-59 S	109-02-29 E	0	Lighthouse	Concrete	Cilacap
40	4163	G	Menara Suar Giliselang	08-23-50 S	115-43-00 E	1	Lighthouse	Steel Lattice Tower	Benoa
41	4176	М	Menara Suar Bukit Badung	08-23-50 S	115-08-38 E	1	Lighthouse	Steel Lattice Tower	Benoa
42	4178	К	Menara Suar Gili Trewangan	08-21-00 S	116-01-28 E	1	Lighthouse	Steel Lattice Tower	Benoa
43	4180	М	Menara Suar Ampenan	08-34-00 S	116-04-30 E	1	Lighthouse	Steel Lattice Tower	Benoa
44	4335	М	Tanjung Putting	03-30-36 S	111-46-25 E	0	Lighthouse	Steel Lattice Tower	Banjarmasin
45	4350	М	Tanjung selatan pada tanjung	04-10-30 S	114-39-00 E	0	Lighthouse	Steel Lattice Tower	Banjarmasin
46	4363	В	Ma. Sungai Barito	03-36-42 S	114-27-07 E	0	Light Beacon	Collapsed	Banjarmasin
47	4370	В	Sungai Barito Belakang	03-31-16 S	114-30-08 E	0	Light Beacon	Galvanis Steel Lattice	Banjarmasin
48	4730	Т	Tukong Hill	01-16-30 S	116-48-30 E	0	Lighthouse	Steel lattice tower	Samarinda
49	4741	М	Kutai River (Ma. Pegah)	00-58-44 S	117-18-57 E	0	Light Beacon	GRP Tower	Samarinda
50	4890	Т	Tg. Mangkalihat	00-59-30 N	118-59-08 E	0	Lighthouse	Steel lattice tower	Samarinda
51	4910	D	Mensu De Brill	06-04-57 S	118-54-30 E	1	Lighthouse	Steel Lattice Tower	Makassar
52	4913	К	Mensu Kalukalukuang	05-10-30 S	117-39-32 E	1	Lighthouse	Steel Lattice Tower	Makassar
53	4930	К	Mensu Kodingareng Lompo	05-09-03 S	119-15-53 E	1	Lighthouse	Steel Lattice Tower	Makassar
54	5020	*	Mensu Kapoposang	04-41-40 S	118-56-47 E	1	Lighthouse	Steel Lattice Tower	Makassar
55	5040	М	Tg. Lero Pare Pare	04-02-54 S	119-36-38 E	0	Light Beacon	Steel Lattice Tower	Makassar
56	5110	D	Mensu Tg. Karang	00-38-28 S	119-43-42 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
57	5120	*	Tuguan (Noord Wachter)	00-35-00 N	119-48-00 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
58	5140	М	Menara Suar Salando	01-20-30 N	120-48-10 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
59	5160	К	Kr. MaIalungun Utara karang.	01-55-32 N	118-26-40 E	0	Light Beacon	Steel Lattice Tower	Tarakan
60	5171	В	P. Maratua tanjung Bolituwatan	02-18-52 N	118-33-43 E	0	Lighthouse	Steel Lattice Tower	Tarakan
61	5365	*	Menara suar Mayu	01-19-10 N	126-21-32 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
62	5390	Т	Mensu Talise	01-53-10 N	125-05-40 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
63	5441	*	Marore	04-44-30 N	125-28-30 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
64	5444	*	Menara Suar Miangas	05-33-46 N	126-35-38 E	1	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
65	5490	Ν	Gorontalo	00-29-39 N	123-03-18 E	0	Lighthouse	Steel Lattice Tower	Manado/Bitu ng
66	5530	М	Rambu suar Walea	00-25-00 S	122-25-30 E	1	Light Beacon	Steel lattice tower	Manado/Bitu ng
67	5580	М	Mensu wangi - wangi	05-15-30 S	122-32-00 E	1	Lighthouse	Steel Lattice Tower	Kendari
68	5586	К	Mensu tanjung Pawali	03-59-50 S	123-01-00 E	0	Lighthouse	Steel Lattice Tower	Kendari
69	5716	М	Menara suar Letty	08-13-05 S	127-36-05 E	0	Lighthouse	Steel Lattice Tower	Kupang
70	5800	В	Menara suar Tg. Kurung	10-07-30 S	123-26-30 E	0	Lighthouse	Steel Lattice Tower	Kupang

# Appendix 9.1.4 Locations and Current Situation of RACONs

No.	No. (DSI)	Racon Code	Name of Lights	Lat	Long	Operation Status	Type of ATN	Structure	ATN Office
71	5830	*	Menara suar Mety - Miarang	08-20-00 S	128-29-30 E	1	Lighthouse	Steel Lattice Tower	Kupang
72	5887.1	G	Kr. Tegal. Key Is.	05-28-40 S	132-49-00 E	0	Light beacon	Steel lattice tower	Ambon
73	5920	Ν	Nusanive	03-47-30 S	128-05-30 E	0	Lighthouse	Steel lattice tower	Ambon
74	5992	D	Tg Kayu Merah	00-45-40 N	127-21-48 E	0	Light beacon	Steel lattice tower	Ambon
75	6000	М	Merauke	08-30-00 S	140-22-30 E	0	Lighthouse	Steel Lattice Tower	Merauke
76	6010	М	Merauke (Habee) di pulau Habee	08-14-30 S	139-26-13 E	0	Light beacon	Steel Lattice Tower	Merauke
77	6130	K	Tg Suaja	02-31-51 S	140-44-40 E	1	Lighthouse	Steel Latice Tower	Jayapura
78	6161	G	Menara suar P. Kofian	01-11-00 S	129-58-00 E	0	Lighthouse	Steel lattice tower	Sorong
79	6162	Ν	Menara suar P.Nampale	01-47-20 S	129-37-29 E	0	Lighthouse	Steel lattice tower	Sorong
80	6341	*	Menara suar P. Buaya	00-50-20 S	131-12-26 E	0	Lighthouse	Steel lattice tower	Sorong
81	Collapse d	*	*	*	*	*	*	*	*
82	Collapse d	*	*	*	*	*	*	*	*
83	Collapse d	*	*	*	*	*	*	*	*
84	Collapse d	*	*	*	*	*	*	*	*

**Appendix 9.1.4 Locations and Current Situation of RACONs** 

Note:

"1" and "0" of Operation Status show "In Services (Good)" and "Out of Services", respectively

### Appendix 9.1.5 Condition of Vessels for Aids to Navigation Services

As	of	May	31,	2001

		ID	Name of Shin	Class	Trme	Built	Gross	Length	Width	Draft	MainEngine	Generator	Crane	Technical
	ATN Office		Name of Ship	Class	туре	Year	Tonnage	(m)	(m)	(m)	(HP)	(HP)	Capacity	Condition
1	SABANG	1	KN ANTARES		Aids Tender Vessel	1999	550.00	42.00	9.50	3.00	2×540	2×125,1×62	6 Ton	100%
2	SADANG	1	KN B-133		Aids Tender Vessel	1965	34.08	21.54	4.55	1.61	1×240	1×5		65%
3			KN ARCTURUS		Aids Tender Vessel	1999	550.00	42.00	9.50	3.00	2×540	2×125,1×62	6 Ton	92.93%
4	BELAWAN	2	KN SUAR-008		Aids Tender Vessel	1973		21.52	5.02	2.01	1×150	1×18,1×10		61.74%
5			KN B-118		Aids Tender Vessel	1961	45.10	21.60	4.60	1.66	1×240	1×5		51.41%
6	SIBOLGA	3	KN ALTAIR		Aids Tender Vessel	1999	550.00	42.00	9.50	3.00	2×540	2×125,1×62	6 Ton	100%
7			KN KARAKATA		<b>Buoy Tender Vessel</b>	1972	589.10	47.43	10.02	3.64	1×850	2×150,1×80	12 Ton	85%
8			KN MITRA-		Aids Tender Vessel	1975	50.00	21.28	4.75	1.85	1×168	1×30,1×15		71%
9	DUMAI	4	KN SUAR-012		Aids Tender Vessel	1981		22.00	6.60	3.28	1×382	1×140,1×62		61%*
10	DOMAI	4	KN SUAR-006		Aids Tender Vessel	1973		21.13	5.00	1.98	1×150	1×18		63%
11			KN AE-025		Inspection Boat	1969	82.65	19.50	5.00	2.72	1×245	1×10		55%
12			KN DUDAT D-045		Aids Tender Vessel	1953	83.51	24.48	5.15	2.32	1×150	1×12		59%
13			KN ADHARA		Aids Tender Vessel	1999	550.00	42.00	9.50	3.00	2×540	2×125,1×60	6 Ton	100%
14			KN PARI		Buoy Tender Vessel	1978	644.46	52.90	10.00	3.50	1×850	2×190,1×115	18 Ton	61.70%
15	TG.PINANG	5	KN MITRA-		Aids Tender Vessel	1975	65.00	22.10	5.10	1.90	2×163	1×55,1×43		54.40%
16			KN SUAR-004		Aids Tender Vessel	1971		20.86	4.45	2.07	1×200	1×13		60.68%
17			KN MANTANG		<b>Inspection Boat</b>	2000	30.00	15.40	4.75	0.85	2×760	1×20		100%
18	TLK BAYUR	6	KN MUCI		Supply Vessel	1975	698.83	44.06	9.80	5.00	1×1,200	2×150,1×85	6 Ton	61.10%
19			KN DAIK (D-044)		Aids Tender Vessel	1953	65.19	26.43	5.02	2.32	1×150	1×12		50%
20			KN DATTA D-047		Aids Tender Vessel	1953	57.97	28.46	4.97	2.08	1×150	1×12		65.76%
21	PALEMBANG	7	KN SUAR-001		Aids Tender Vessel	1951	36.12	22.36	4.12	1.85	1×115	1×10		59.99%
22			KN AE-028		<b>Inspection Boat</b>	1969	59.02	20.34	4.91	2.79	1×245	1×10		64.44%
23			KN B-125		Aids Tender Vessel	1961	34.54	21.41	4.59	1.66	1×240	1×5		57.13%
24	TG.PRIOK	8	KN MESA		Buoy Tender Vessel	1972	644.46	52.93	10.00	4.50	1×850	2×190,1×115	12 Ton	Sunken at 2000
25			KN PAMANCASA		Supply Vessel	1978	904.52	45.60	10.00	5.70	1×1,200	2×150,1×85	6 Ton	60.00%
26	TC PRIOK	8	KN PERMATA		Supply Vessel	1953	684.89	53.27	9.70	2.95	1×500	2×40,1×20	6 Ton	46.21%
27	10.1 MOK	0	KN MITRA-		Aids Tender Vessel	1960	75.00	18.23	5.40	3.00	1×235	2×35		62.97%
28			KN SUAR-014		Aids Tender Vessel	1980	108.58	22.60	5.00	2.30	1×380	1×140,1×62		42.64%

	ATN Office	ID	Name of Shin	Class	Type	Built	Gross	Length	Width	Draft	MainEngine	Generator	Crane	Technical
	AIN Onice		Name of Smp	Class	туре	Year	Tonnage	(m)	(m)	(m)	(HP)	(HP)	Capacity	Condition
29	TC PRIOK	8	KN AP-027		Aids Tender Vessel	1966	46.67	17.15	4.80	2.30	1×150	1×10		56.41%
30	IG. I MOR	0	KN AB-P3		Aids Tender Vessel	1971	8.16	9.60	3.00	1.50	1×100			58.11%
31			KN B-126		Aids Tender Vessel	1961	34.01	21.15	4.63	1.64	1×240	1×5		61.35%
32	SEMADANC	0	KN SUAR-011		Aids Tender Vessel	1980		22.90	6.60	2.30	1×382	1×140,1×62		53.92%
33	SEMARAING	9	KN B-008		Aids Tender Vessel	1945	39.63	18.94	4.60	1.70	1×240	1×5		58.53%
34			KN B-124		Aids Tender Vessel	1961	44.37	20.44	4.58	1.64	1×240	1×5		54.92%
35		10	KN SUAR-005		Aids Tender Vessel	1971		21.05	4.22	1.80	1×200	1×13		70.21%
36	CILACAP	10	KN SUAR-007		Aids Tender Vessel	1973		21.17	5.00	1.99	1×200	1×13		68.70%
37			KN PRAJAPATI		Buoy Tender Vessel	1979	684.68	47.90	10.00	4.50	1×850	2×190,1×115	18 Ton	67.95%
38			KN MANDALIKA		Supply Vessel	1975	767.62	44.90	9.85	5.10	1×1,200	2×150,1×85	6 Ton	54.54%
39	SURABAYA	11	KN DAMARA		Aids Tender Vessel	1953	72.98	23.83	4.92	2.10	1×240	1×12		59.23%
40			KN SUAR-002		Aids Tender Vessel	1951		20.93	4.00	1.75	1×115	1×10		59.55%
41			KN AE-029		Inspection Boat	1969	82.65	19.50	5.00	2.72	1×230	1×5		59.47%
42	DENOA	19	KN MIZAN		Aids Tender Vessel	1996	257.20	37.00	9.00	2.959	2×650	2×125,1×62	5 Ton	<b>98</b> %
43	DEINOA	12	KN BOGA		Aids Tender Vessel	1952	194.34	35.90	6.53	2.37	1×430	1×40,1×9		60%
44	DONTIANAK	19	KN BALAM		Aids Tender Vessel	1952	192.87	35.90	6.53	2.37	1×430	1×40,1×9		44%
45	POINTIAINAK	15	KN AE-012		Inspection Boat	1967	47.99	17.75	4.50	2.58	1×150	1×24,1×10		<b>58</b> %
46			KN BIDO		Aids Tender Vessel	1952	194.34	35.90	6.53	2.37	1×430	1×40,1×9		50.12%
47	DANIADMACINI	14	KN SUAR-003		Aids Tender Vessel	1971		21.05	4.22	1.80	1×200	1×15		58%
48	DANJARWASIN	14	KN AE-032		Inspection Boat	1971	82.65	19.50	5.00	2.72	1×245	1×10		76.75%
49			KN MOKMER		Inspection Boat	1999	37.00	17.00	4.20	0.80	2×700	2×20		97.95%
50			KN MITHUNA		Buoy Tender Vessel	1975	644.23	47.90	10.00	3.50	1×850	2×190,1×115	12 Ton	57%
51	SAMARINDA	15	KN DAGONG		Aids Tender Vessel	1953	79.22	24.79	5.64	1.90	1×150	1×12		39%
52			KN SUAR-010		Aids Tender Vessel	1975		21.13	5.20	1.98	1×150	1×18,1×10		62%
53	SAMARINDA	15	KN MARAPAS		Inspection Boat	1999	37.00	17.00	4.20	0.80	2×700	2×20		100%
54	TADAKAN	10	KN BLEKOK		Aids Tender Vessel	1952	191.50	36.03	6.54	2.28	1×430	1×40,1×9		41%
55	IAKANAN	10	KN DUKU (D-043)		Aids Tender Vessel	1953	77.52	24.79	5.04	1.90	1×150	1×12		49%

	ATN Office	ID	Name of Ship	Class	Tuno	Built	Gross	Length	Width	Draft	MainEngine	Generator	Crane	Technical
	AIN Onice		Name of Smp	Class	туре	Year	Tonnage	(m)	(m)	(m)	(HP)	(HP)	Capacity	Condition
56			KN MERAK		Aids Tender Vessel	1996	257.20	37.00	9.00	2.959	2×650	2×125,1×62	6 Ton	89.59%
57	BITUNG	17	KN SUAR-009		Aids Tender Vessel	1974	49.71	21.52	5.02	2.50	1×150	1×18,1×10		62.75%
58			KN B-134		Aids Tender Vessel	1964	34.68	21.54	4.55	1.63	1×240			67.49%
59	KENDADI	10	KN BARAU		Aids Tender Vessel	1952	192.87	35.90	6.54	2.37	1×430	1×40,1×9		41%
60	KENDARI	10	KN BAYAN		Aids Tender Vessel	1952	192.87	38.20	6.50	2.95	1×430	1×40,1×9		48%*
61			KN MENGKARA		Aids Tender Vessel	1996	257.20	37.00	9.00	2.959	2×650	2×125,1×62	6 Ton	73.98%
62	UJ.PANDANG	19	KN MITRA-		Aids Tender Vessel	1960	150.00	24.40	6.30	3.00	2×360	1×55,1×25		55.10%
63			KN B-120		Aids Tender Vessel	1961	41.38	21.60	4.60	1.66	1×150	1×6		60%
64	KUDANC	20	KN MINA		Aids Tender Vessel	1997	257.20	37.00	9.00	2.959	2×650	2×125,1×62	6 Ton	98%
65	KUFANG	20	KN DINGKI D-045		Aids Tender Vessel	1953	79.22	24.79	5.04	1.90	1×150	1×12		51%
66	AMBON	91	KN MAYANG		Aids Tender Vessel	1996	257.20	37.00	9.00	2.959	2×650	2×125,1×62	6 Ton	98%
67	AWBON	21	KN BENDALU		Aids Tender Vessel	1952	192.87	35.90	6.53	2.37	1×430	1×40,1×9		Sunken
68			KN ALDEBARAN		Aids Tender Vessel	1999	550.00	42.00	9.50	3.00	2×540	2×125,1×62	6 Ton	100%
69		00	KN TNH. MERAH		Aids Tender Vessel	1966	142.96	27.50	6.30	2.65	1×230	2×22.5,1×20		64%
70	JATAPURA	22	KN TLK. DORERI		Aids Tender Vessel	1970	150.00	27.50	6.40	2.65	1×230	1×30,1×20		49%*
71			KN FJS RMAINUM		Aids Tender Vessel	1972	84.45	21.50	6.10	2.75	1×550	1×100,1×15		60%
72			KN MAHKOTA		Aids Tender Vessel	1997	257.20	37.00	9.00	2.959	2×650	2×125,1×62	6 Ton	98%
73	SOPONC	99	KN PRADAWANA		Buoy Tender Vessel	1979	762.78	47.90	10.60	4.50	1×850	2×190,1×115	12 Ton	85%
74	SORONG	23	KN RAJA AMPAT		Inspection Boat	1954	397.79	37.00	6.72	2.13	1×150	1×20		36%
75			KN S.KAIBUS		Aids Tender Vessel	1955	29.57	11.00	3.00	1.25	1×68	1×5		50%
76			KN MERPATI		Aids Tender Vessel	1997	257.20	37.00	9.00	2.959	2×650	2×125,1×62	6 Ton	98%
77	MERAUKE	24	KN TLK. KABARE		Inspection Boat	1962	207.50	32.55	7.20	2.50	2×225	2×15		61%
78			KN BINTANGGOR		Inspection Boat	1967	133.08	19.00	4.52	1.51	1×100	1×15		73%
79	ртир	25	KN BIMASAKTI		Survey Vessel	1984	1,373.00	59.75	13.00	5.35	2×1,500	3×303,1×150	3 Ton	82%
80	DIKP	20	KN KUMBA		Buoy Tender Vessel	1972	589.23	47.43	10.02	3.64	1×850	2×150,1×80	12 Ton	60%

							Operation	L		
No.	Name	Class	Num. of Personnel	Operation Hours	GMDSS	500kHz	2182 / 6215 kHz	CH16	NAVTEX	Remarks
I	SABANG									
I-1	SUB DISNAV									
I-2	SROP									
1	Sabang	2nd	18	16H	-	•	•	•	-	
2	Ulee Lheue	4th-A	3	9H	-	-	•	•	-	
3	Meulaboh	4th-A	1	9H	-	-	•	-	-	
4	Tapak Tuan	4th-A	3	9H	-	-	•	•	-	
5	Sinabang	4th-A	1	7H	-	-	-	•	-	
6	Sigli	4th-B	-	7H	-	-	-	-	-	Fix only
7	Susoh	4th-B	2	7H	-	-	-	•	-	
8	Singkel	4th-B	2	7H	-	-	•	-	-	
9	Idi	4th-B	-	7H	-	-	-	-	-	Fix only
Π	BELAWAN									
II-1	DISNAV-II	2nd								
II-2										
II-3	ADPEL/KPLP									
III-4	SROP									
10	Belawan	1st	49	24H	•	•	•	•	-	
11	Kuala Taniung	4th-A	1	6H	-	-	•	•	-	
12	Tg Balai Asahan	4th-A	2	6H	-	-	•	•	-	
13	Lhok Seumawe	4th-A	2	8H	_	_	•	•	-	
14	Kuala Langea	Ath-A	2	5H	-	_	•	-	-	
14	Ta Tiram (Ta Sarang Flang)	4th-A	2	6H	_	_	-	_	_	Fix only
10	I abuban Dilik	4th A	2	CH CH	_					I'lk olliy
10	Labunan bink	4tfr-A	2	011	-	-	•	-	-	
17		4th-D	na	na	-				-	<b>T</b> :
18		4th-D	2		-	-	-	-	-	Fix only
19	Sei Berombang	4th-B	2	6H	-	-	-	-	-	F1X Only
20	Pangkalan Susu	4tn-B	na	na	-				-	
TTT										
	SIDULGA									
111-1	SUBDISNAV									
111-2	SROP	. 1	10	4.011	-	-	-			
21	Sibolga	3rd	13	18H	•	•	•	-	-	
22	Gunung Sitoli	4th-A	4	8H	-	•	•	•	-	
23	Pulau Tello	4th-A	2	9H	-	-	•	-	-	
24	Lahewa	4th-A	2	na						
25	Teluk Dalam	4th-A	3	7H	-	-	•	•	-	
	DIBAA									
IV	DUMAI									
IV-1	DISNAV-I	1st								
IV-2	ADPEL/KPLP									
IV-3	SROP									
26	Dumai	1st	59	24H	•	•	•	•	-	
27	Tembilahan	4th-A	1	10H	-	-	•	•	-	
28	Bagan Siapi-Api	4th-A	1	6H	-	-	-	-	-	Fix only
29	Panipahan	4th-A	1	8H	-	-	-	-	-	Fix only
30	Bengkalis	4th-A	2	8H	-		•		-	
31	Selat Panjang	4th-A	2	5H	-	-	•	-	-	
32	Pekan Baru	4th-A	5	10H	-	-	•	•	-	
33	Rengat	4th-A	1	5H	-	-	•	-	-	
34	Pulau Kijang	4th-B	-	-	-	-	-	-	-	
35	Kuala Enok	4th-B	1	7H	-	-	-	-	-	Fix only
36	Sungai Gintung	4th-B	-	-	-	-	-	-	-	
	0.0									
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No.	Name	Class	Num. of Personnel	Operation Hours	GMDSS	500kHz	2182 / 6215 kHz	CH16	NAVTEX	Remarks
V	TANJUNG PINANG									
V-1	DISNAV-I	1st								
V-2	ADPEL/KPLP									
V-3	SROP									
37	Batu Ampar	3rd	11	24H	•	-	•	•	-	
38	Tg. Uban	3rd	5	14H	-	-	•	•	-	
39	Sei Kolak Kijang	3rd	16	14H	•	-	•	•	-	
40	Tarempa	4th-A	2	11H	-	-	•	•	-	
41	Tg. Balai Karimun	4th-A	1	11H	-	-	•	•	-	
42	Pulau Sambu	4th-A	3	10H	-	-	•	•	-	
43	Tg. Pinang	4th-A	2	11H	-	-	•	•	-	
44	Dabo Singkep	4th-B	2	11H	-	-	•	•	-	
45	Natuna	4th-B	2	11H	-	-	•	•	-	
VI	TELUK BAYUR									
VI-1	DISNAV-II	2nd								
VI-2	SROP									
46	Teluk Bayur	2nd	32	24H	-	•	•	•	-	
47	Air Bangis	4th-B	3	8H	-	-	•	•	-	
48	Sipora	4th-B	na	8H	-	-	-	-	-	Fix only
49	Siberut	4th-B	na	8H	-	-	-	-	-	Fix only
50	Sikabaluan	4th-B	na	8H	-	-	-	-	-	Fix only
51	Sikakap	4th-B	na	8H	-	-	-	-	-	Fix only
										- 0
VII	PALEMBANG									
VII-1	DISNAV-II	2nd								
VII-2	SROP	-114								
52	Palembang	1st	30	24H	-	•	•	•	-	
53	Jambi	3rd	4	15H	_	_	•	•	_	
54	Muara Sahak	4th-A	1	5H	-	-	_	_	-	Fix only
55	Muntok	4th-A	1	8H	-	-	•	•	-	1 ix only
56	Kuala Tungkal	4th-A	6	7H	_	-	•	•	_	
57	Pangkalan Balam	4th-A	3	7H	-	-	•	•	-	
58	Tg. Pandan	4th-A		12H	-	-	•	•	-	
59	Ninah Paniang	4th-B	2	3H	-	-	-	-	-	Fix only
60	Manggar	4th-B	1	3H	_	-	_	-	_	Fix only
61	Sungai Selan	4th-B	-	5H	-	-	-	-	-	Fix only
62	Blinvu	4th-B	1	5H	_	-	_	-	_	Fix only
63	Sungai Lumpur	4th-B	1	5H	-	-	-	-	-	Fix only
64	Toboali	4th-B	1	3H	-	-	-	-	-	Fix only
			_							
VIII	TANJUNG PRIOK									
VIII-1	DISNAV-I	1st								
VIII-2										
VIII-3	ADPEL/KPLP									
VIII-4	BASARNAS									
VIII-5	METEOROLOGI									
VIII-6	PUSAT PELATIHAN									
VIII-7	SROP									
65	Jakarta Radio	1st	116	24H	•	•	•	•	•	
66	Panjang	3rd	12	24H	•	•	•	•	-	
67	Cirebon	3rd	15	10H	-	•	•	•	-	
68	Pusat Pemberitaan	3rd	16			-		-		
69	Bengkulu	4th-A	3	7H	-	-	•	•	-	
70	Cigading	4th-A	1	6H	-	-	•	•	_	
71	Sunda Kelapa	4th-A	-					-		doesn't exist
72	Pelabuhan Ratu	4th-A	2	4H	-	-	-	-	_	Fix only
73	Bintuhan	4th-B	na	3H	-	-	-	-	-	Fix only

			r								
No.	Name	Class	Num. of Personnel	Operation Hours	GMDSS	500kHz	Operation 2182 / 6215 kHz	CH16	NAVTEX	Remarks	
74	Kimao	4th-D	<b>n</b> 0	லப						Fix only	
74	Kota Agung	4th B	na	211 9H	_	_	_		_	Fix only	
75	Mosuji	4th B	na	211 2H	-	_	_	-	_	Fix only	
77	Way Senutih	4th-B	na	3H	-	-	-	-	_	Fix only	
78	Anver	4th-B	1	7H	-	-	•	•	-	1 IA OIIIJ	
79	Muara Binuangeun	4th-B	1	4H	-	-	-	-	-	Fix only	
80	Bojo Negara	4th-B	1	5H	-	-	-	-	-	Fix only	
81	Eretan	4th-B	1	na						- 0	
82	Pangandaran	4th-B	2	2H	-	-	-	-	-	Fix only	
83	Karang Antu	4th-B	1	na							
84	Kronjo	4th-B	-	na							
85	Indramayu	4th-B	1	4H	-	-	-	-	-	Fix only	
86	Pamanukan	4th-B	1	5H	-	-	-	-	-	Fix only	
IX	SEMARANG										
IX-1	DISNAV-II	2nd									
IX-2	SROP										
87	Semarang	2nd	38	24H	•	•	•	•	-		
88	Tegal	4th-A	5	14H	-	-	•	•	-		
89	Pekalongan	4th-A	4	7H	-	-	•	-	-		
90	Karimun Jawa	4th-A	2	6H	-	-	•	-	-		
91	Juwana	4th-B	3	6H	-	-	•	-	-		
92	Rembang	4th-B	1	6H	-	-	•	-	-		
93	Jepara	4th-B	2	6H	-	-	•	-	-		
X	CILACAP										
X-1	SUB DISNAV										
X-2	SROP	0.1	15	1011				•			
94	Cilacap	2nd	10	10П	•	•	•	•	-		
VI	CIDADAVA										
XI-1	DISNAV-I	1et									
XI-2		150									
XI-3	ADPEL/KPLP										
XI-4	SROP										
95	Surabaya	1st	65	24H	•	•	•	•	-		
96	Panarukan	4th-A	2	11H	-	-	•	•	-		
97	Kali Anget	4th-A	2	8H	-	-	•	•	-		
98	Meneng (Banyuwangi)	4th-A	3	11H	-	-	•	•	-		
99	Gresik	4th-A	3	8H	-	-	•	•	-		
100	Probolinggo	4th-A	2	10H	-	-	•	•	-		
101	Bawean	4th-A	2	11H	-	-	•	-	-		
102	Pasuruan	4th-A	1	6H	-	-	-	-	-	Fix only	
103	Masalembo	4th-A	2	8H	-	-	•	-	-		
104	Branta	4th-B	-	-	-	-	-	-	-	doesn't exist	
105	Tuban	4th-B	-	-	-	-	-	-	-	doesn't exist	
106	Besuki	4th-B	-	-	-	-	-	-	-	doesn't exist	
XII	BENOA										
XII-1	DISNAV-II	2nd									
XII-2	SROP										
107	Benoa	3rd	28	24H	•	•	•	•	-		
108	Lembar	3rd	9	12H	•	-	•	•	-		
109	Padang Bai	4th-A	5	6H	-	-	•	•	-		
110	Celukan Bawang	4th-A	3	9H	-	-	•	•	-		
111	Bima	4th-A	3	9H	-	-	•	•	-		
112	Badas	4th-A	4	6H	-	-	•	•	-		
113	Gilimanuk	4th-A	3	8H	-	-	•	•			

No.	Name	Class	Num. of Personnel	Operation Hours	GMDSS	500kHz	2182 / 6215 kHz	CH16	NAVTEX	Remarks
114	Labuhan Lombok	4th-A	3	10H	-	-	•	٠	-	
115	Labuhan Haji	4th-B	-							doesn't exist
116	Kempo	4th-B	-							doesn't exist
117	Benete	4th-B	2	8H	•	-	•	•	-	
XIII	KUPANG									
XIII-1	DISNAV-II	2nd								
XIII-2	SROP									
118	Kupang	2nd	23	24H	•	•	•	•	-	
119	Ex Dilli	3rd	-	-	-	-	-	-	-	out
120	Ende	4th-A	1	12H	-	-	•	٠	-	
121	Waingapu	4th-A	1	9H	-	-	•	٠	-	
122	Maumere	4th-A	1	8H	-	-	•	٠	-	
123	Kalabahi	4th-A	1	8H	-	-	•	•	-	
124	Larantuka	4th-A	1	7H	-	-	•	•	-	
125	Atapupu	4th-A	1	7H	-	-	•	٠	-	
126	Reo	4th-A	1	8H	-	-	•	٠	-	
127	Seba	4th-A	1	8H	-	-	•	•	-	
XIV	PONTIANAK									
XIV-1	SUB DISNAV									
XIV-2	SROP									
128	Pontianak	3rd	13	13H	•	•	•	٠	-	
129	Ketapang	4th-A	2	6H	-	-	•	•	-	
130	Sintete	4th-A	2	6H	-	-	•	•	-	
131	Telok Air	4th-B	1	5H	-	-	-	•	-	
			_							
xv	BANJARMASIN									
XV-1	DISNAV-II	2nd								
XV-2		2114								
XV-3	ADPEL/KPLP									
XV-4	SROP									
132	Banjar Masin	2nd	21	16H	-	•	•	•	-	
133	Kota Baru	4th-A	na	na						
134	Sampit	4th-A	2	10H	-	-	•	•	-	
135	Kumai	4th-A	2	8H	-	-	•	•	-	
136	Pulau Pisau	4th-A	na							doesn't exist
137	Batulicin	4th-A	1	6H	-	-	•	•	-	
138	Pegatan	4th-B	na					-		doesn't exist
139	Pegatan Mandawi	4th-B	na	-						doesn't exist
140	Pangkalan Bun	4th-B	na	-						doesn't exist
110	i unghunun Dun	IIII D	IIa							ubesh t exist
XVI	SAMARINDA									
XVI-1	DISNAV-I	1st								
XVI-9		150								
XVI-3	ADPET/KBLD									
XVI-4	SROP									
1/1	Balik Panan	2nd	24	24H	•	•	•	•		
141	Samarinda	2nd	0 0	19H	-	-		-	_	
142	Muara Pegah	4th-A	-			-	-	-	-	doeen't aviet
140	Ta Santan	Ath-A	3	6H	_	_	•			ucesii t exist
144	rg. Salitali	401-A	0 20	n	-	-	-	-		
140	Sangkulirang	4th-D	11a	на сµ						
140	Tanah Grocet	401°D	1	011 1U			-			Firr onl
147	Tailall Grogot	4th B	na	4f1	-	-	-	-	-	r1x only
148	Dontally	-iui-D	114	11a						

No.	Name	Class	Num. of Personnel	Operation Hours	GMDSS	500kHz	2182 / 6215 kHz	CH16	NAVTEX	Remarks
XVII	TARAKAN									
XVII-1	DISNAV-II	2nd								
XVII-2	SROP									
149	Tarakan	3rd	12	24H	•	•	•	•	-	
150	Nunukan	4th-A	2	8H	-	-	•	•	-	
151	Tg. Selor	4th-B	1	na						
152	Tg. Badan	4th-B	1	na						
XVIII	UJUNG PANDANG									
XVIII-1	DISNAV-I	1st								
XVIII-2										
XVIII-3	ADPEL/KPLP									
XVIII-4	SROP									
153	Makasar	1st	51	24H	•	•	•	•	•	
154	Pare-pare	4th-A	3	10H	-	-	•	•	-	
155	Mamuiu	4th-A	1	10H	-	_	•	•	-	
156	Palono	4th-A	3	9H	-	_	•	-	-	
157	Bulukumba	Ath-B	1	6H	-	-		-	-	Fix only
158	Majene	4th-B	1	6H	-	_	-	-	-	Fix only
150	Bajoo	4th B	1	6H	_		_		_	Fix only
160	Solavar	4th-B	1	9H	-	_	•			1 IX OIIIy
161	Polowali	4th B	1	6H	-	-	•	-	-	Fix only
169	Siniai	4th B	1	6H	_	-	-		-	Fix only
162	Jonoponto	4th B	1 20	n	_	-	-		-	Fix only
105	seneponto	401 D	IIa	IIa						
VIV	KENDARI									
VIV-1	SUB DISNAV									
VIV-9	SUBDISINAV									
164	ShOF	2nd	19	19 <b>日</b>						
104	Rendari	oru 2l	10	1211 19U	•	-	•	•	-	
160	Dau-bau	ara 44b - A	1	12H 7U	-	-	•	•	-	
100	Kana Kalala	4th-A	1	/П 9Ц	-	-	•	-	-	E'
107		4th-A	11a 9	71	-	-	-	-	-	Fix only
168	Pomalaa	4th-A		711 EU	-	-	•	•	-	
109		4th-D	na	511 EU	-	-	•	-	-	
170	Maini	4t11°D	па	511	-	-	•	-	-	
XX	MANADO BITUNG									
XX-1	DISNAV-I	1st								
XX-2										
XX-3	ADPEL/KPLP									
XX-4	SROP									
171	Bitung	1st	49	24H	•	•	•	•	-	
172	Pantoloan	3rd	8	12H	•	•	•	•	-	
173	Donggala	4th-A	3	9H	-	-	•	•	-	
174	Gorontalo	4th-A	3	7H	-	-	•	•	-	
175	Luwuk	4th-A	3	8H	-	-	•	•	-	
176	Poso	4th-A	2	13H	-	-	•	•	-	
177	Toli-toli	4th-A	2	8H	-	-	•	•	-	
178	Ulu Siau	4th-A	1	7H	-	-	•	-	-	
179	Manado	4th-A	4	7H	-	-	•	٠	-	
180	Tahuna	4th-A	2	11H	•	-	•	•	-	
181	Parigi	4th-A	2	5H	-	-	•	٠	-	
182	Kolonedale	4th-A	2	8H	-	-	•	•	-	
183	Kuandang	4th-A	3	10H	-	-	•	•	-	
184	Tagulandang	4th-B	na	-						doesn't exist
185	Banggai	4th-B	na	-						doesn't exist
186	Moutong	4th-B	na	-						doesn't exist
187	Bunta	4th-B	na	-						doesn't exist

No.	Name	Class	Num. of Personnel	Operation Hours	GMDSS	500kHz	2182 / 6215 kHz	CH16	NAVTEX	Remarks
188	Wani	4th-B	na	-						doesn't exist
189	Ampana	4th-B	2	6H	-	-	•	-	-	
190	Pagimana	4th-B	na							doesn't exist
XXI	AMBON									
XXI-1	DISNAV-I	1st								
XXI-2										
XXI-3	ADPEL/KPLP									
XXI-4	SROP									
191	Ambon	1st	59	24H	•	•	•	•	•	
192	Ternate	3rd	3	14H	•	•	•	•	-	
193	Tobelo	4th-A	1	3H	-	-	-	-	-	Fix only
194	Tual	4th-A	2	9H	-	-	•	•	-	
195	Banda	4th-A	1	6H	-	-	•	•	-	
196	Elat	4th-A	1	3H	-	-	-	-	-	Fix only
197	Saumlaki	4th-A	1	6H	-	-	•	-	-	
198	Morotai	4th-A	1	3H	-	-	-	-	-	Fix only
199	Dobo	4th-A	1	3H	-	-	-	-	-	Fix only
200	Namlea	4th-A	1	3H	-	-	-	-	-	Fix only
201	Sanana	4th-A	1	15H	•	-	•	•	-	
202	Jailolo	4th-B	1	3H	-	-	-	-	-	Fix only
203	Labuha	4th-B	1	3H	-	-	-	-	-	Fix only
204	Saparua	4th-B	1	3H	-	-	-	-	-	Fix only
205	Leksula	4th-B	1	3H	-	-	-	-	-	Fix only
206	Amahai	4th-B	1	3H	-	-	-	-	-	Fix only
XXII	SORONG									
XXII-1	DISNAV-I	1st								
XXII-2	ADPEL/KPLP									
XXII-3	SROP									
207	Sorong	2nd	12	17H	•	•	•	•	-	
208	Manokwari	3rd	9	12H	•	-	•	•	-	
209	Fak-fak	4th-A	3	10H	•	-	•	•	-	
210	Kaimana	4th-A	2	6H	-	-	•	-	-	
211	Bintuni	4th-A	2	3H	-	-	•	-	-	
212	Amamapare	4th-A	1	6H	-	-	•	-	-	
213	Teminubuan	4th-B	na	4H	-	-	•	-	-	
214	Kokas	4th-B	na	3H	-	-	-	-	-	Fix only
XXIII	JAYAPURA									
XXIII-1	DisNav	2nd								
XXIII-2										
XXIII-3	ADPEL/KPLP									
XXIII-4	SROP									
215	Jayapura	1st	28	24H	•	•	•	•	•	
216	Biak	3rd	na	12H	•	-	•	•	-	
217	Serui	4th-A	2	9H	-	-	•	•	-	
218	Sarmi	4th-A	1	13H	-	-	•	•	-	
219	Nabire	4th-A	2	2H	-	-	-	-	-	Fix only
XXIV	MERAUKE									
XXIV-1	SUBDISNAV									
XXIV-2	SROP		-	1017	-	-	-	-		
220	Merauke	3rd	6	12H	•	•	•	•	-	
221	Agats	4th-A	2	9H	-	-	•	-	-	
222	Bade	4th-A	2	6H	-	-	•	-	-	
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