Chapter 16

MODERNIZING AND MAINTAINING DOMESTIC FLEET

16. MODERNIZING AND MAINTAINING DOMESTIC FLEET

This chapter highlights the optimization of ship investment through selecting the most attractive ship type, assigning it in a suitable manner and maintaining its asset value during a desirable ship life.

In regard to vessel procurement and assignment, the Study examined liner shipping fleet since the role of liner shipping will be further increased as an inter-island infrastructure. There is no country in the world that requires such a vast inter-island liner system other than Indonesia. In spite of this, it is difficult to find second-hand vessels in the ship markets abroad suitable for local needs. Thus, it is worth considering originally designing vessels that are most suitable for Indonesia.

Apart from the above it is also important to prevent assets from depreciating rapidly. In this regard, the Study strongly recommends the introduction of the ship-management company concept in domestic shipping. A workable model company is planned in this chapter.

16.1. Innovation of Fleet Design and Operation

(1) Selection of Model Ships

The Study has projected a sharp traffic increase in scheduled liner services, i.e., 14.8 million tons in 2002 to 66.0 million tons in 2024. The driving force of such service expansion is attributed to accelerating containerization. Ever large container vessels on domestic waters such as 15,000 DWT and 20,000 DWT will be able to ply on routes with heavy demand provided that port infrastructures allow them.

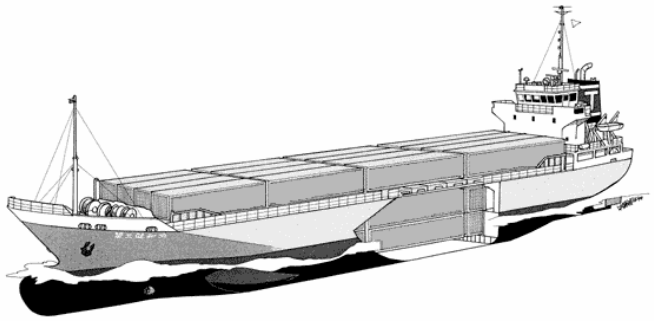
Common carriers provide scheduled liner services which play an important role as prime inter-island transport corridor by way of providing not only regular and indiscriminating services but also competitive services. Competitiveness affects many aspects of transport services and its effectiveness is gauged based on many considerations such as; extensive coverage of container haulage; introduction of other convenient forms of unitization; reasonable tariff setting; fast delivery; mass haulage and others.

General speaking, competitive services can be introduced and expanded as traffic grows and shippers' affordability increases. In addition, inherent local conditions may provide unique opportunities to enable assignment of a competitive fleet. In order to identify the most suitable and competitive liner fleet for Indonesia in the future, the Study selects the following three model ships beside ordinary container ships:

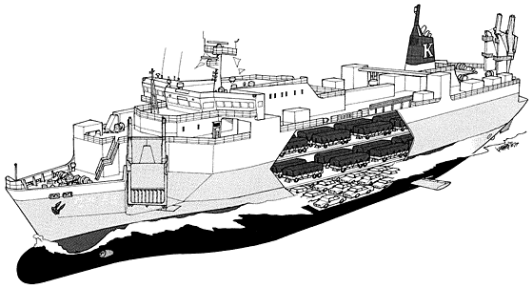
- **Shallow and wide container ship** considering the calm waters of Java Sea and the presence of several major river ports in Sumatra, Kalimantan and Sulawesi.
- **Ro-Ro ship** taking account of many of short to medium-distance container routes between large cities where demand for high-value goods such as vehicles, cargo on trailers and time-sensitive valuables is expected.
- **Multipurpose ship** taking account of long inter-island routes as national trunk routes where container and vehicles must be provided transport even though demand is insufficient to assign a full container vessel or a RoRo vessel.

Figure 16.1.1 Illustrations of Model Ships

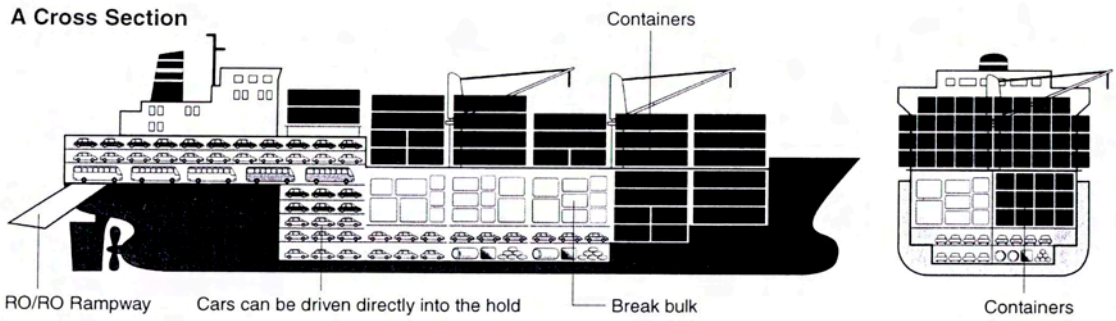
Container Ship



RoRo Ship



Multipurpose Ship



(2) Analysis of Model Ships

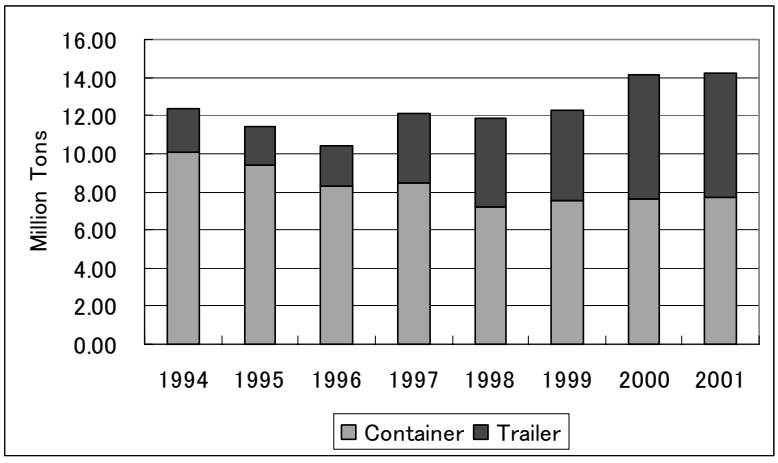
Fleet issues in formulating inter-island liner network: Presently, domestic container trade has a more distinct pattern compared with conventional general cargo haulage. Most of container traffic is concentrated within routes associated with 13 major ports: Tg. Priok, Tg. Perak, Belawan, Makassar, Batam, Teluk Bayur, Panjung, Pontianak, Banjarmasin, Balikpapan, Samarinda, Bitung and Jayapura. During the Master Plan period, the share of traffic between these 13 major ports system will slightly decrease to three-fourths of the total as container network expands in the future. It implies two fleet assignment issues in future. One is how to economically and efficiently meet massive traffic demand between the 13 major ports while the other is how to serve rather small and scattered traffic demand and to connect with a number of other ports in a financially sustainable way.

Shallow water depth and Java Sea crossing: From a traffic demand point of view, the 13 major ports are able to accommodate full container vessels ranging from 10,000 DWT to 20,000 DWT. But some of the ports have water depth limitation problems. For instance, three river ports in Kalimantan such as Pontianak, Banjarmasin and Samarinda cannot berth container vessels over 10,000 DWT. Taking the calm waters of the Java Sea into consideration, a shallow and wide hull vessel can be navigable. Such structured vessel may transport larger container units than an ordinary one under the same draft condition. This is one way to solve the inherent water depth limitation problem although it is almost impossible to procure such rather custom-made vessels in the second-hand market.

Future unitization trend: Japanese experience has some implications in promoting unitized shipping on Indonesian domestic waters, particularly assigning Ro-Ro vessels. It is noted that Japan has a fleet of vehicle carriers for domestic use of 49 ships or 197,871 GT in 2003. Ro-Ro vessels in Japan transport cargo on trailer (55%), cargo in container (14%), and others such as vehicles (31%). It is worth noting that in regard to the transport of vehicles in Indonesia; almost all are transported by Ro-Ro vessels or industrial car carriers. Ro-Ro vessels play a significant role in the following areas in the case of Japan:

- Container transportation: The share was 22% in terms of cargo ton and 40% in terms of cargo ton-km in 2001.
- Trailer (chassis) transportation: Trailer traffic has been sharply increasing from 2.2 million tons in 1994 to 6.5 million tons in 2001. This upward trend actually offsets a downturn trend in container traffic or probably as a result of changes in shipping form.

Figure 16.1.2 Trend in Unitized Cargo Volume in Japanese Domestic Shipping



Source: MLIT of Japan

In Indonesian domestic shipping, trailer transportation has not been practiced yet. Instead, particularly after the economic crisis, door-to-door truck haulage using Ro-Ro vessels on line-haul has obtained a certain share. According the Study's collected information, Ro-Ro operators charge 50-100% higher tariff rate compared with container operators. It proves the emergence of a market of shippers who require fast and scheduled service for high valued cargo. Economic development, especially industrialization beyond Java Island, will accelerate the growth of such market. However it is still questionable that trailer transportation will replace the current door-to-door truck haulage like what happened in developed countries. The reason why the tractor-trailer pattern is popular in developed countries is because of its advantage in eliminating the need to for driver's wage during sailing time and to increase utilization of hull space. But such labor cost reduction is not significant in Indonesia and Ro-Ro operators are reluctant to procure vehicles (tractors and trailers) through their own expenses.

Pros and cons of Ro-Ro vessel compared with container vessel: Although the transport form of container vessels and Ro-Ro vessels are different (containers by

container vessel and vehicles by Ro-Ro vessel), both are engaged in unitized shipping. The comparison can be made in respect of various shipping performance indicators: (Refer to Table 16.1.1)

- Container vessel can transport heavier cargo deadweight. Hull space utilization of Ro-Ro vessel is not efficient.
- Cargo handling productivity of Ro-Ro vessel is almost three (3) times larger than container vessel's due to its roll-on/roll-off operation.
- Ro-Ro vessel shows faster operation than container vessel due to fast navigation and short port time.
- Ro-Ro vessel has an advantage to set a higher freight tariff than container vessel. In other words, the Ro-Ro market is focused more on shippers who are willing to pay more for faster service. However, such shippers represent a small fraction of the general container market only.
- It is possible to set a lower stevedoring rate per unit through negotiation with PELINDO and/or private sector stevedoring company.
- Ro-Ro vessel is superior to container vessel in fuel consumption.
- Ro-Ro vessel can transport passengers if accommodation space is allocated at upper decks.
- Comparison of container per diem with truck depreciation is difficult because there is no information available to estimate the future percentage of trucks arranged by owners.
- Vessel cost for container vessel is cheaper than Ro-Ro vessel.

Figure 16.1.3 Innovative Transportation and Logistics Solutions (Door to Door Service by Ro-Ro Vessel)

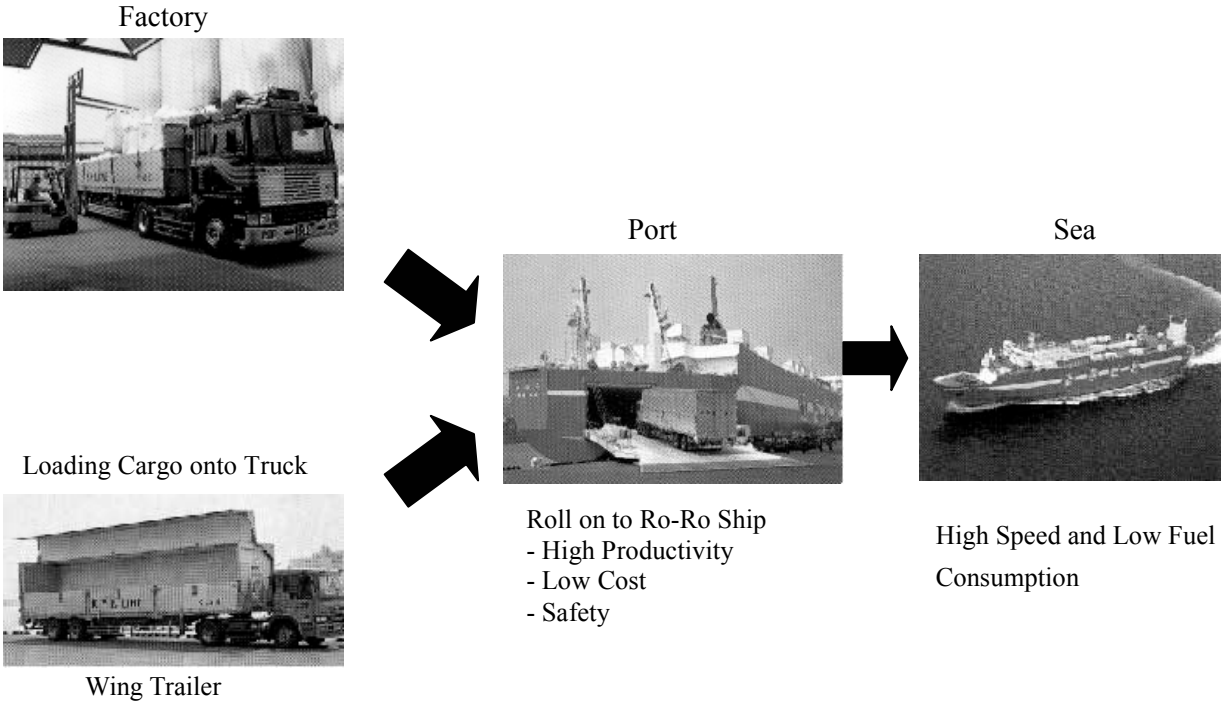


Table 16.1.1 Comparison of Ship Particular between Container Vessel and Ro-Ro Vessel

Ship's Type	Container	Rating	Ro-Ro	Rating
Gross Tonnage	17,000	S	16,000	S
DWT (ton)	12,000	A	6,000	
Av. Ship's Speed (knot)	17.2		18.0	A
Loading/Discharging Efficiency	10~15 units/hr x 2 cranes (280~420 ton/hr)		Truck 50 unit/hr (50unit x 20 ton=1,000t/hr)	A
Round Voyage Days 1/	5.3		4.2	A
Freight	1.5~1.7 milRp/20'FCL		2.5~2.7 milRp/truck (12t)	A
Port Charge / call	9.8 million Rp.	S	9.6 million Rp	S
Stevedorage *Total*	*FCL* 3,000/14 t =214 unit 214x0.1638=35milRp *Empty* 150x0.1158=17.37 milRp *52.37 milRp*		3,000 ton / 0.3 =10,000m^3 10,000m^3x0.005=50 milRp *50 milRp*	A
Fuel consumption/day	58.5 tons		53.7 tons	A
Container Per diem	954unit x $1.75 x 8,400 x 3 =42.1 mil Rp.	?	Depend on ratio of shipper's truck	?
Building Cost	2,900 mil Yen	A	3,200 mil Yen	

Note: 1/ Simulation result of future operation on Surabaya – Makassar route
A: More Attractive Condition, S: Almost Same Condition, ?: Uncertain Comparison

Limited Availability of Ro-Ro Fleet in Second-hand Market

As the result of the above comparison clearly shows, Ro-Ro fleet is attractive in Indonesian inter-island shipping. In fact, archipelago countries such as Japan, Philippines and Indonesia have substantial demand for Ro-Ro services. Most of existing Ro-Ro vessels in Indonesia are Japanese made like those in the Philippines. Most of them used to serve the Seto Inland Sea in Japan and they were sold abroad after the Seto Inland Sea was bridged between Main Island and Shikoku Island during the period 1987 - 1998. Finally three bridges were constructed and most of the inland Ro-Ro vessels disappeared.

Recently, Ro-Ro fleet has decreased in Japan and it now consists of larger vessels for mainly serving long-distance routes. According to statistics, there are 20 long-distance ferry routes being served by 53 vessels. The average route distance is 1,007 km is 2003. Therefore, there may be no more possibility that Japan will be able to sell as many Ro-Ro vessels to the second-hand market abroad as it did in the 1990s. Also there is no other country that exports young Ro-Ro vessels like Japan. In Indonesia, consolidated efforts will be necessary between shipping and shipbuilding industries to build the most locally suitable Ro-Ro vessels.

Long inter-island routes: Indonesia has many long inter-island routes. In most cases, however, the demand is not sufficient to be serviced by container vessels or RoRo vessels. Multi purpose ship transportation system covers various cargo types, such as general cargo, container cargo and vehicles, and different loading/discharging systems. Multi-purpose ship is suitable for a route with a hybrid of these freight needs. Different from typical Ro-Ro route, i.e. short distance route and involving only 2 ports; multi-purpose ship is suitable for a long distance route covering multiple ports, such as:

- Tg. Priok --- Batam ---Belawan; and,
- Tg. Priok --- Surabaya --- Makassar --- Bitung.

Due to its multi-functioned nature, a multi-purpose ship may not be able to compete with a container ship and a Ro-Ro ship in terms of tariff setting provided that those long-distance routes have sufficient demand. Under such circumstances, multi-purpose ships should rather serve minor routes and provide container and vehicle shipping services to the benefit the users of minor ports. In this sense, multi-purpose fleet will be able to play a strategic role in promoting unitized shipping nationwide.

(3) Ship Design Plan

Based on the above analysis, each model ship type serves a different demand segment. Considering those local demand segments, several ship section plans and their general particulars have been prepared.

- Container vessel: To meet a wide range of container demand by routes, vessels with a capacity from 300 to over 1,000 TEU are designed. The designed vessels are also categorized into ship-gear type and full celler type.
- Ro-Ro vessel: Two types are designed. One is good for many routes having shallow draft and passenger accommodation while the other is effective where the route has considerable vehicle demand.
- Multipurpose ship: Two types are designed depending on demand and infrastructure conditions. However their basic functions are the same, i.e. carrying container, general cargo and vehicle simultaneously while handling cargo by ship-gear.
- In the each ship model, ship draft starts from 5 meters taking into account the shallow water depth at many river ports and remote major ports in Indonesia.

Table 16.1.2 Matrix of Ship's Types of Routes

Route	Ro-Ro	Lo-Lo (Container)	Multi Purpose
Shallow draft and Short distance＜500'	A	P	x
Shallow draft and Long distance＞500'	x	A	P
Middle draft and Short distance＜500'	A	A	x
Middle draft and Long distance＞500' on heavily demanded routes	x	A	P
Middle draft and Long distance＞500' on moderately demanded routes	x	P	A

Note: A – Attractive Vessel, P – Practical Vessel, x – Not practical Vessel

Figure 16.1.2 Container Ship (C-96 shallow draft)

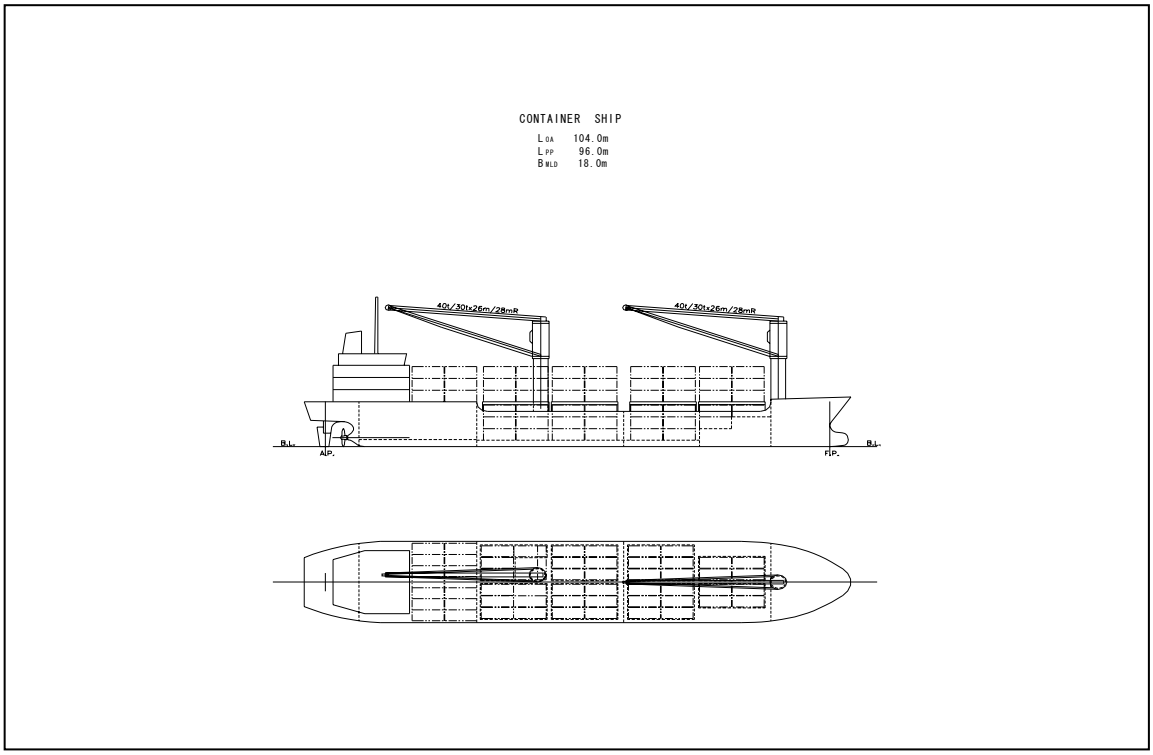


Figure 16.1.3 Container Ship (C-154 with ship's crane)

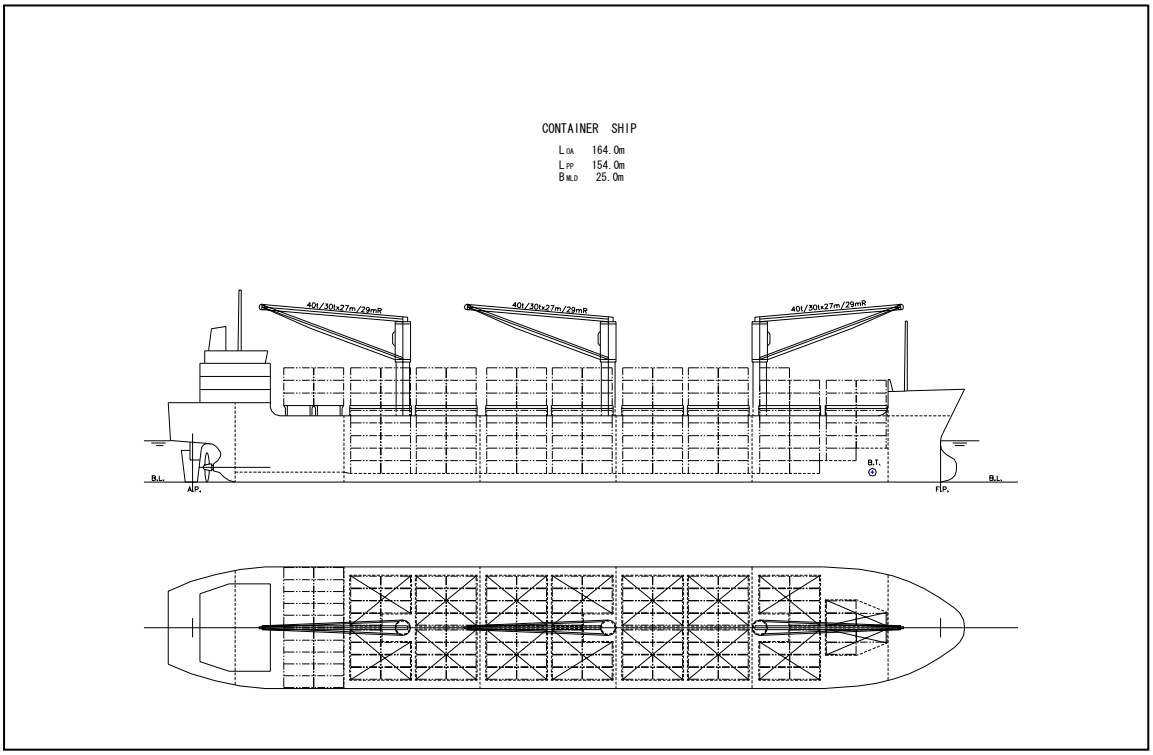


Figure 16.1.4 Container Ship (C-154 full cellular)

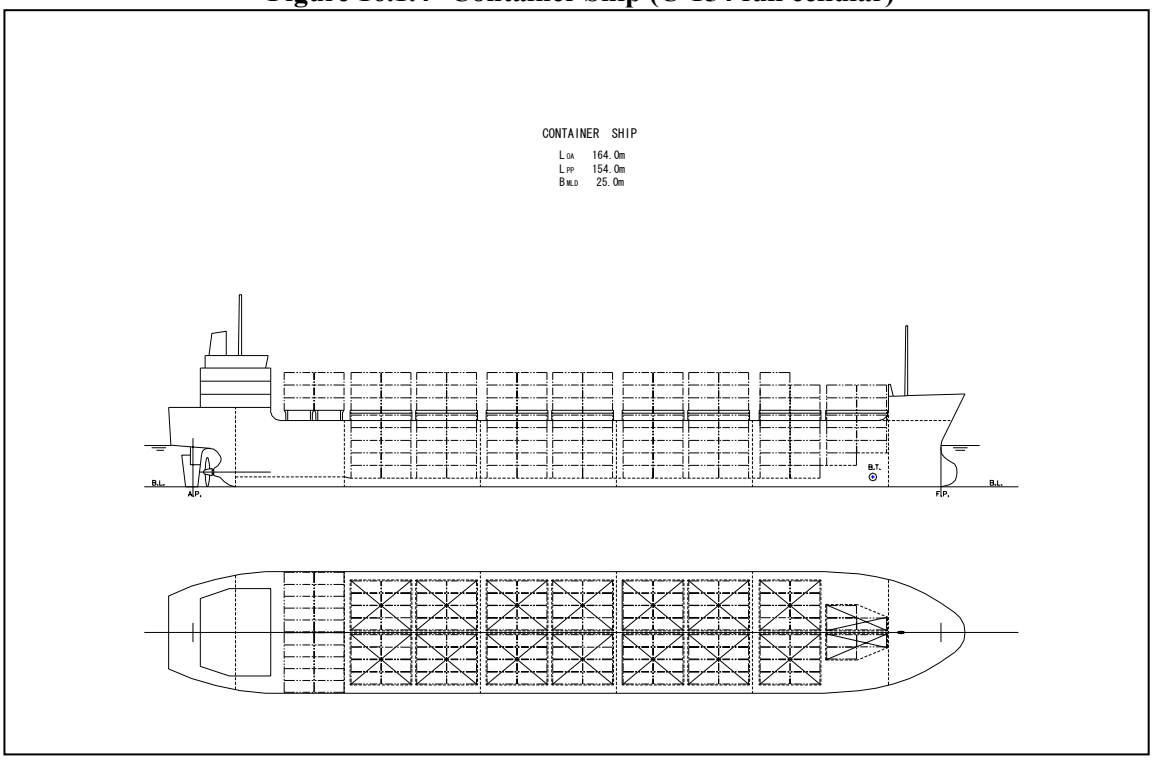


Table 16.1.1 Principal Particular of Container Ship

NAME	C-96			C-125		C-154 d=8.5m without DC Crane	C-154 d=8.5m
Loa(m)	104			135		164	164
Lpp(m)	96			125		154	154
Bld(m)	18			25		25	25
Doa(m)	7.8			12.5		13.6	13.6
Draft(m)	5.5			5.0		8.5	8.5
GT(International)	6,000			13,500		17,000	17,000
Cruising Range(sm)	2,500	2,500	2,500	2,500	2,500	3,500	3,500
Cruising Speed(knot)	14	15	16	15	16	19	19
Main Engine (Low Speed Engine)	1set			1set		Low speed 1set	Low speed 1set
Max. Out Put(KW)	3,250	4,550	6,500	5,500	7,700	13,440	13,440
Nor. Out (KW)	2,925	4,095	5,850	4,950	6,930	12,096	12,096
Container(TEU)	300			568		1,002	954
IN HOLD	106					508	476
ON DECK	194					494	478
Cargo Deadweight(t)	3,000			6,800		12,000	11,900
Total Deadweight(t)	4,000			8,700		16,000	15,900
Hull Weight(t)	1,820					5,950	5,960
Container Handling Equipment Deck Crane	40t/30t×26m/28mR 2sets			40t/30t×27m/29mR 2sets		Full Cellular Type without DC Crane	40t/30t27m/29mR 3sets
Bow Thruster	1			1		1	1
Electric Diesel Generator(EG)	450 KW 3sets			550KW 3sets		750KW 3sets	750KW 3sets
FOC(t/day)(Including E.G)	16.9	22.2	30.0	28.2	35.1	58.5	58.5
Bhilding Cost(million yen)	1,320	1,460	1,660	1,910	2,030	3,030	2,900

Figure 16.1.5 Principal Particular of Ro-Ro Ship

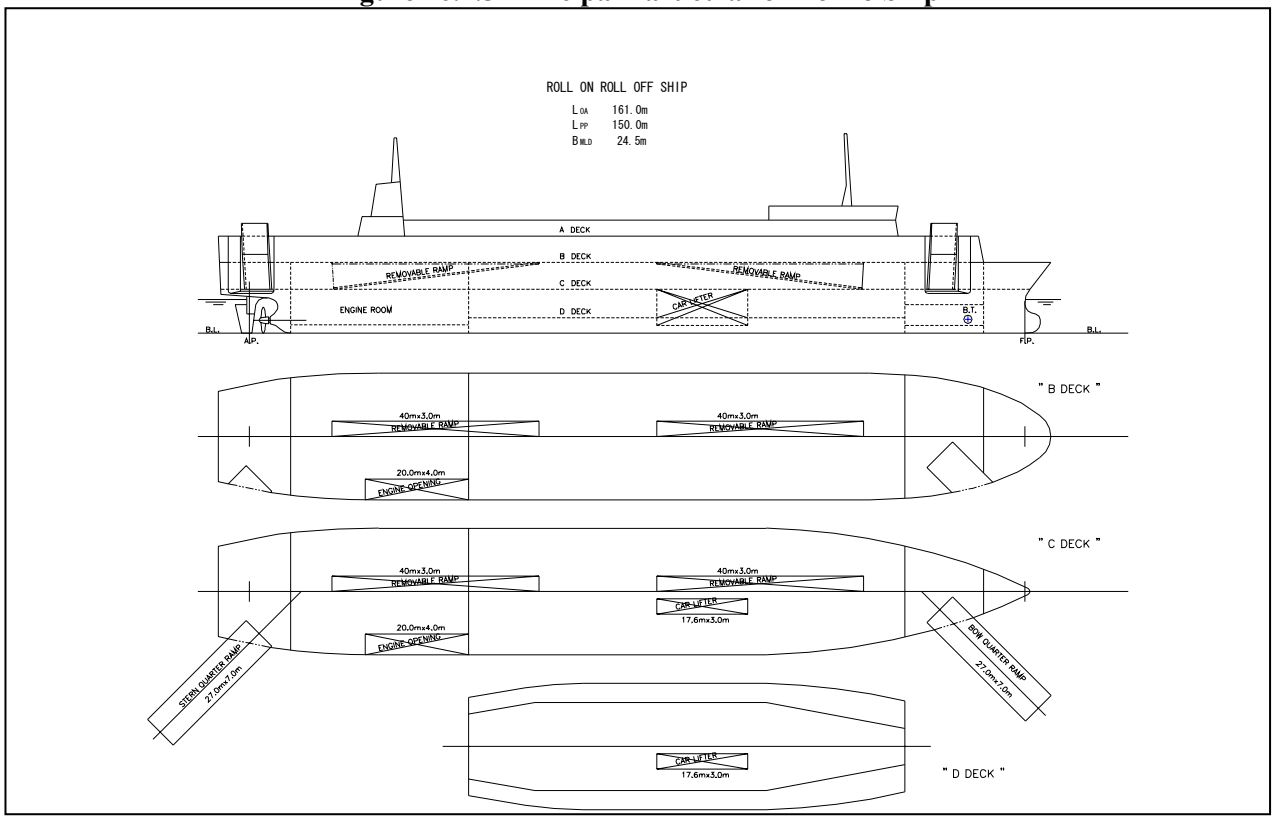


Table 16.1.2 Principal Particular of Ro-Ro Ship

NAME	RP-105			R-150 d=7.0 m
Loa(m)	114			161
Lpp(m)	105			150
Bld(m)	21			24.5
Doa(m)	7.4			8.5
Draft(m)	5			6.5
Nos of car Deck (tier)	1			2
GT(International)	10,000			16,000
Cruising Range(sm)	2,500	2,500	2,500	3,500
Cruising Speed(knot)	15	16	17	20
Main Engine (Low Speed Engine)				
Max. Out Put(KW)	3,300	3,850	5,500	12,000
Nor. Out (KW)	2,970	3,465	4,950	10,800
Passenger	250 P			0
CHassis (12mL) (@30t)	25			125
Car (4.5 mL)	20			125
Cargo Deadweight(t)	800			4,000
Total Deadweight(t)	1,600			6,000
Ro-Ro Equipment				
Bow Quarter Ramp	27m x 7m 1set			27m x 7m 1set
Stem Quarter Ramp	27m x 7m 1set			27m x 7m 1set
Removable Hold Ramp	0			40m x 3m 2set
Fixed Hold Ramp	0			0
Car Lifter	0			18m x 3m 1 set
Bow Thruster	1			1
Electric Diesel Generator(EG)	450 kw 3sets			750 kw 3sets
FOC(t/day)(Including E.G)	19.2	23.4	30.8	53.7
Bhilding Cost(million yen)	1,960	2,000	2,130	3,200

Figure 16.1.6 Multi Purpose Cargo Ship

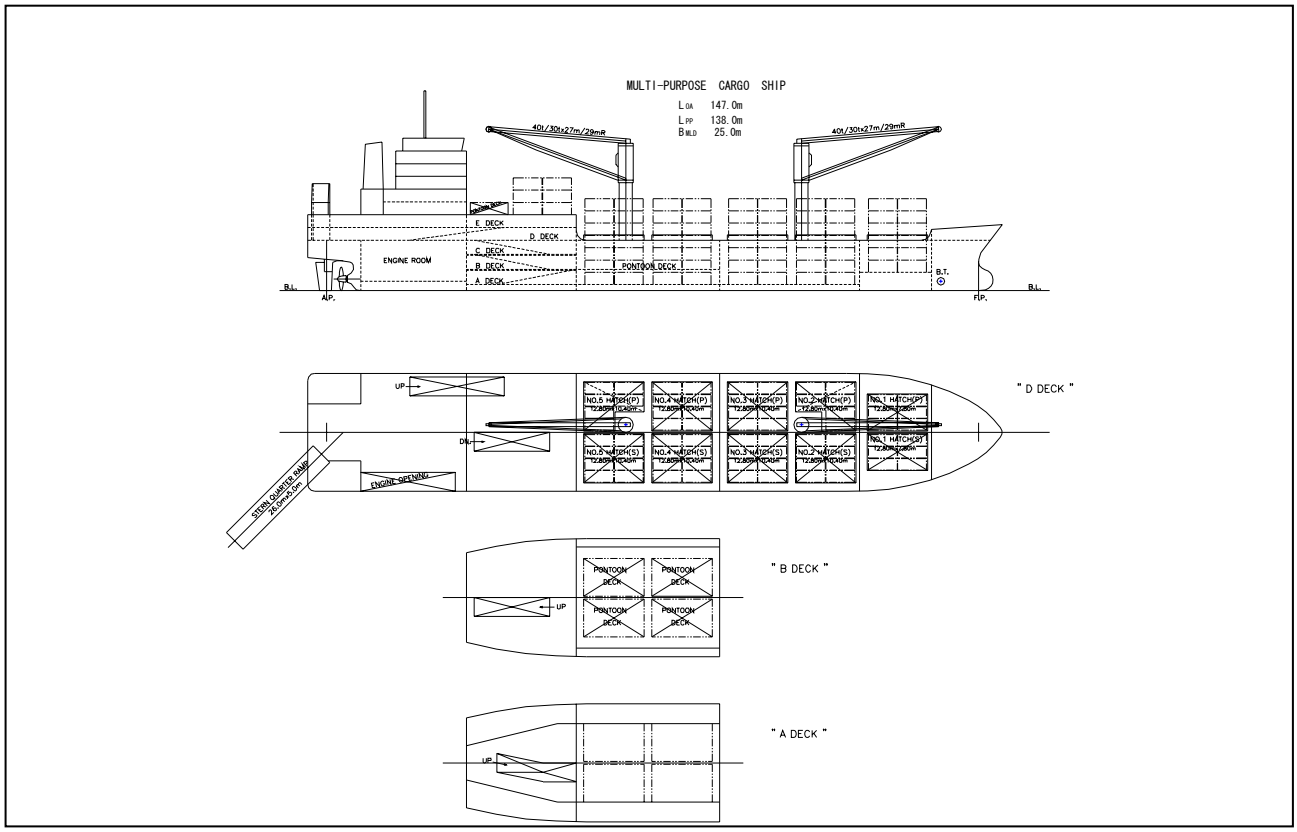


Table 16.1.3 Principal Particular of Multi Purpose Cargo Ship

NAME	HB-120			HB-138 d=7.0m
Loa(m)	129			147
Lpp(m)	120			138
Bld(m)	20			25
Doa(m)	10.7			10.7
Draft(m)	5			7
GT(International)	7,000			12,500
Cruising Range(sm)	2,500	2,500	2,500	3,500
Cruising Speed(knot)	15	16	17	20
Main Engine (Low Speed Engine)	1 set			1 set
Max. Out Put(KW)	3,850	4,950	6,600	12,000
Nor. Out (KW)	3,465	4,455	5,940	10,800
Container(TEU)	198			462
in hold (tier)	90(4)			184(4)
on deck (tier)	108(2)			278(3)
Truck (9 ml)	15			20
Car (4.5 m)	171			330
Cargo Deadweight(t)	2,500			4,500
Total Deadweight(t)	3,500			6,350
Ro-Ro Equipment				
Stem Quarter Ramp	26m x 5m 1set			26m x 5m 1set
Fixed Hold Ramp	3 Sets			4 Sets
Car Deck Panel (2nd Deck)	4 Sets			4 Sets
Container Handling Equipment Deck Crane	40t/30t x 27m/29mR 2 sets			40t/30t x 27m/29mR 2 sets
Bow Thruster	1			1
Electric Diesel Generator(EG)	450 kw 3sets			550 kw 3sets
FOC(t/day)(Including E.G)	19.2	23.4	30.8	53.7
Bhilding Cost(million yen)	1,740	1,810	1,900	2,460

16.2. Introduction of Ship-management Company

16.2.1. Urgent Needs for Improvement of Ship-management

One of the reasons for the low in productivity of the Indonesian domestic fleet is that too many ships are experiencing operation disruptions, or are having mechanical problems. In order to improve this situation, the following three measures should be taken systematically:

1. Improvement of seafarers management;
2. Re-education of seafarers; and,
3. Restructuring of ship-maintenance.

(1) Improvement of Seafarers Management

Under the current situation, seafarers on Indonesian ships are typically working on contract basis and are not employees of the shipping company.

Due to the sluggish economy, unemployment is high and it is very difficult to find jobs once unemployed. The seafarer manpower market is experiencing the same trend. Thus, many seafarers are hesitant to leave their present employment for fear of unemployment. This trend is more apparent in the domestic shipping industry. Seafarers are therefore employed at low wages. In other words, domestic shipping manpower market is a buyer's market.

A large number of ship owners feel that assigning long on-board periods at a time for seafarers is favorable because it enhances the crew's familiarity of the ships; and, they wouldn't have to pay repatriation fees.

Under the current management system, seafarer's leave the vessel once the vessel is at port, leaving only the deck watch keeper on-board. This system does not allow for intensive vessel upkeep and ship maintenance.

The current seafarer management system is creating the following problems:

- Difficulties in retaining seafarers' willingness to work and concentration;
- Decrease in operating rate of and capacity of equipment due to the lack of maintenance;
- Increase in equipment failure and subsequent increase in repair cost; and,
- Declining overall ship performance (low commissionable days).

The current Indonesian seafarer management is remarkably far behind compared to countries with advanced marine transport systems.

From the data obtained on seafarers' performance records of shipping companies and ship-management companies of leading countries in marine transport, it is known that seafarers can sustain good performance for a maximum of four months. Thus, in principle, seafarers' boarding period should be limited to four months. This will lead to the following benefits:

1. On-board management is improved thereby ships are well maintained leading to more productive and safer operation;
2. Docking cost and docking time will be reduced; and,
3. Profits can be improved through improvement of ship performance and utilization rate.

In consideration of the above, in order to improve seafarers' management and performance of Indonesian shipping companies, ship owners' perception must be changed by recognizing the following points:

1. Recognize problems as a result of long-term boarding period of seafarers
2. Increasing the employment remuneration (wage, repatriation fee, and extra work) may contribute in heightening seafarers' morale for better performance.
3. Recognize that investments on on-board maintenance cost will result in not only extending the life of the ship but also decreases in-docking cost and docking periods.
4. Understand that increasing expenditures on seafarers and maintenance will lead to increase in commissionable days, and will result in higher ship performance rate and will generate more profit in the end.

   (Note: These scenarios assume that cargo is available and will not be valid if there is over capacity.)

(2) Reeducation of Seafarers

Reeducation of seafarers is inevitable for the improvement of operation management of Indonesian domestic fleets. Educating seafarers based on a practical and useful curriculum is important. The curriculum should be crafted in line with ISM-Code and considering the following points.

(a) Attitude of Officers

There is little distinction in terms of rank among seafarers; i.e. ratings and officers. Relationships among ratings and officers on-board seem harmonious. However, from the viewpoint of ship operation, the lack of distinction between ratings and officers could hinder efficient ship operations.

Ships are better operated under a hierarchical system of organization and ships could not be operated safely without chain of command. Responsibility is implicated in the command chain, and is on the shoulders of officers. Officers are in charge of issuing commands, rating management, management of critical devices. Officers are required to issue commands with through understanding of their responsibilities. For such a system to work, officers have to put some distance between themselves and their subordinates. The following points should be impressed upon all officers.

- Captain, Chief Engine Officer: Sense of leadership and responsibility as a leader
- First Officer, First Engineer: Duties as an assistant to captain, chief engine officer, sense of responsibility as a person in charge of field operations

- Second Officer, Second Engineer: Duties as an assistant to first officer and first engineer, sense of responsibility in his duty
- Third Officer, Third Engineer: Duties as an assistant to his superiors, sense of responsibilities in his duty

(b) Importance of Making, Analyzing and Documenting Accurate Records:

A great number of Indonesian domestic vessels are not keeping accurate records, which may cause problems in the future, such as;

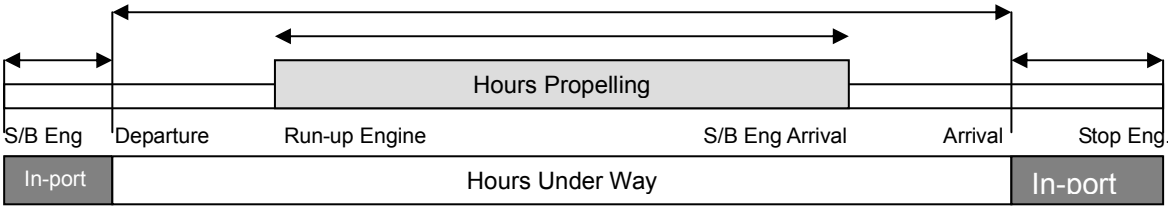
- Unable to plan a maintenance schedule
- Unable to estimate budget for maintenance
- Transfer of knowledge and information to other people is very cumbersome, and personnel replacement will have much difficulty due to the lack of references
- When accident occurs, it would be very difficult to make claims to insurance companies due to lack of reference or evidence.

Responsible persons for records especially officers should be taught and disciplined to religiously keep records without exception. Items that should be kept in logbooks are as follows: (Time and situation must be consistent with deck log book and engine log book).

- Position (position of ship: record by each seafarer on watch and the noon-position)
- Number of revolution of main engine (record by each seafarer on watch, average number of revolutions per minute at noon, and also total-revolution)
- Hours under way
- Hours propelling
- Distance propelling
- Average-Speed
- Engine-Distance
- Slip rate
- Residual distance
- Fuel oil consumption per day and balance, lubricant (system oil and cylinder oil) consumption per day and balance
- Operation time of main engine and sub engine
- Departure-Time, Time for S/B Engine, Time for Run up Engine, Arrival Time, Time for Commence Shifting and Complete Shifting.
- Start and Stop time of Engine/equipment
- Start time and Finish time of loading and unloading
- Others, special notes: (e.g., if main engine is stopped during navigation, or

when maintenance/repair works were conducted, record each time with details)

Figure 16.2.1 Navigation Time Dimensions for Recording Logbook



With respect to following items, records should be kept on separate record sheet/form.

- Working sheet (Deck/Engine)
- Used hours sheet for each device: this form shall be needed when devices are replaced with a backup device or LO is renewed
- Measurement and inspection of disclosed instruments: this form shall be used as reference when next maintenance is conducted, and during budget planning for next year
- Record of freight
- Sea-Protest with Master's Fact Statement
- Record of inventory of spare part/consumable supplies

(c) Specifications of On Board Maintenance

On-board maintenance should be encouraged in order to extend ship life and to reduce docking cost. Through this work, seafarers can contribute to securing benefits for the ship-owner. For this reason, significance of on-board maintenance must be emphasized to seafarers.

Main content of on-board maintenance consists of deck and engine maintenance as follows:

Deck Maintenance

- Inspect and grease-up wires
- Grease-up parts of deck machinery (educate correct grease-up method)
- Prepare replacement of packing, etc.
- Rust removal and paint upper water surface (painting methods need to be taught)

Engine Maintenance

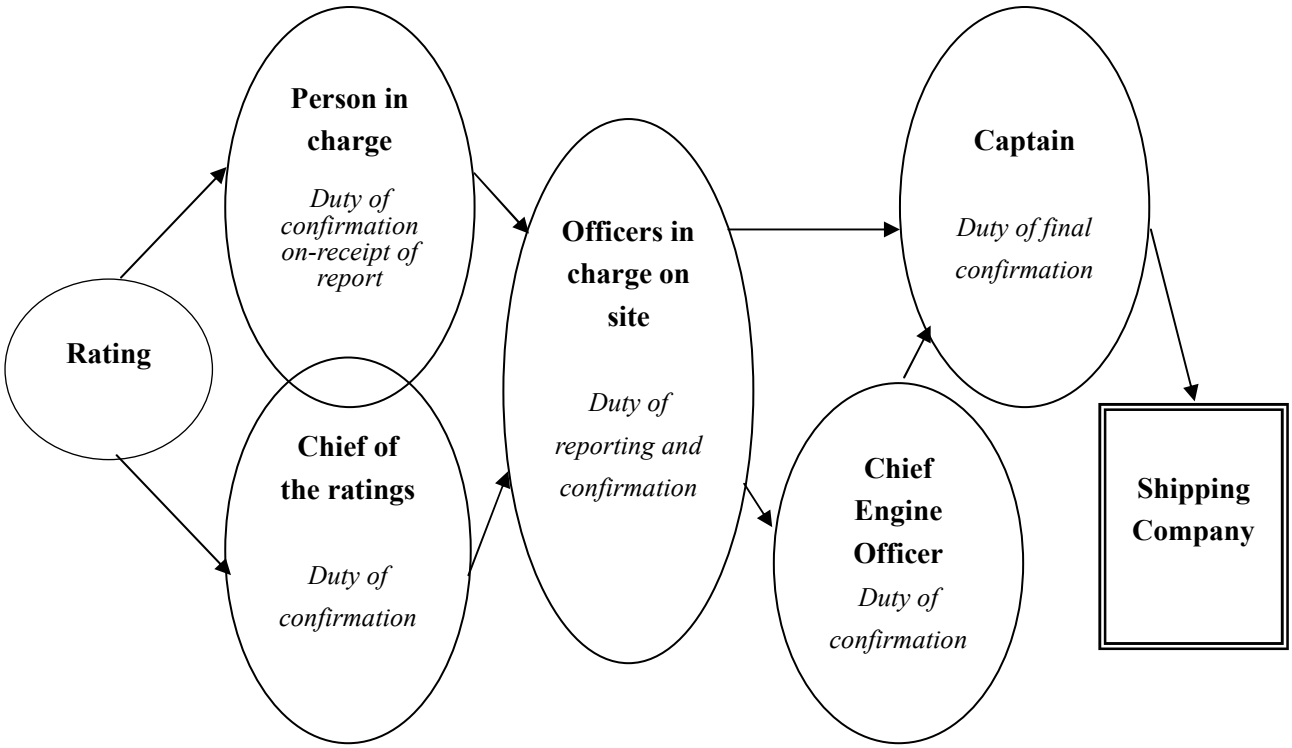
- Periodical inspection of engine and each device (results of which to be known to all concerned)

- Management of lubrication oil and cooling water (periodically lubrication oil needs to be examined. pH should be managed)
- Management of boiler water (pH, salinity, alkali)
- Periodical inspection of resistance of electric instruments
- Replacement of pipes, etc.
- Painting after rust is removed (tank top in particular. Painting method needs to be taught)

(d) Duty to inform:

It is important to enforce seafarers to keep records accurately and concisely. As an overwhelming number of ships are aging, it is extremely important to be able to report the status of ships accurately for accident prevention and to protect the assets of the company. However, as mentioned earlier, seafarers on Indonesian domestic vessels are often serving for a long period at a time and this lowers their concentration level. Furthermore, as they become accustomed with devices, they tend to under estimate detected problems and often neglect their accountability to their company. Thus, the importance of reporting as one of their duties needs to be emphasized to seafarers.

Figure 16.2.2 Exemplary Reporting Procedures



(3) Changing the perceptions of shipowners towards ship-management

It is understandable that all shipowners desire to maximize operation rate of their vessels and to productively use them as long as possible. However, most shipowners are small-scale entities; for example, 82% of INSA Members own less than 3 vessels, and thus many companies do not have enough internal resources to manage their fleets at a satisfactory level. Worse, only a few companies really understand how much they need to invest in maintenance to ensure the satisfactory operation of their own ships.

In order to improve management of shipping operation, changing the perceptions of ship owners towards ship-management is the initial and most critical step. When shipowners cannot manage their fleet at a satisfactory level, the only other option is to contract out management works. The activities the can be contracted out can be grouped into three: maintenance and repair, insurance and crewing.

If a shipping company contracts out those three activities to one qualified ship-management company, the company could benefit from the synergies involved and in the long-term profit from a longer and more stable shipping business. It is also desired for a shipping company to commission the management of their seafarers since they could conduct daily on-board maintenance under the supervision of the ship-management company. (Refer to Figure 16.2.3 and Figure 16.2.4)

Figure 16.2.3 Possible Ship-management Service Areas and Expected Interactive Effects

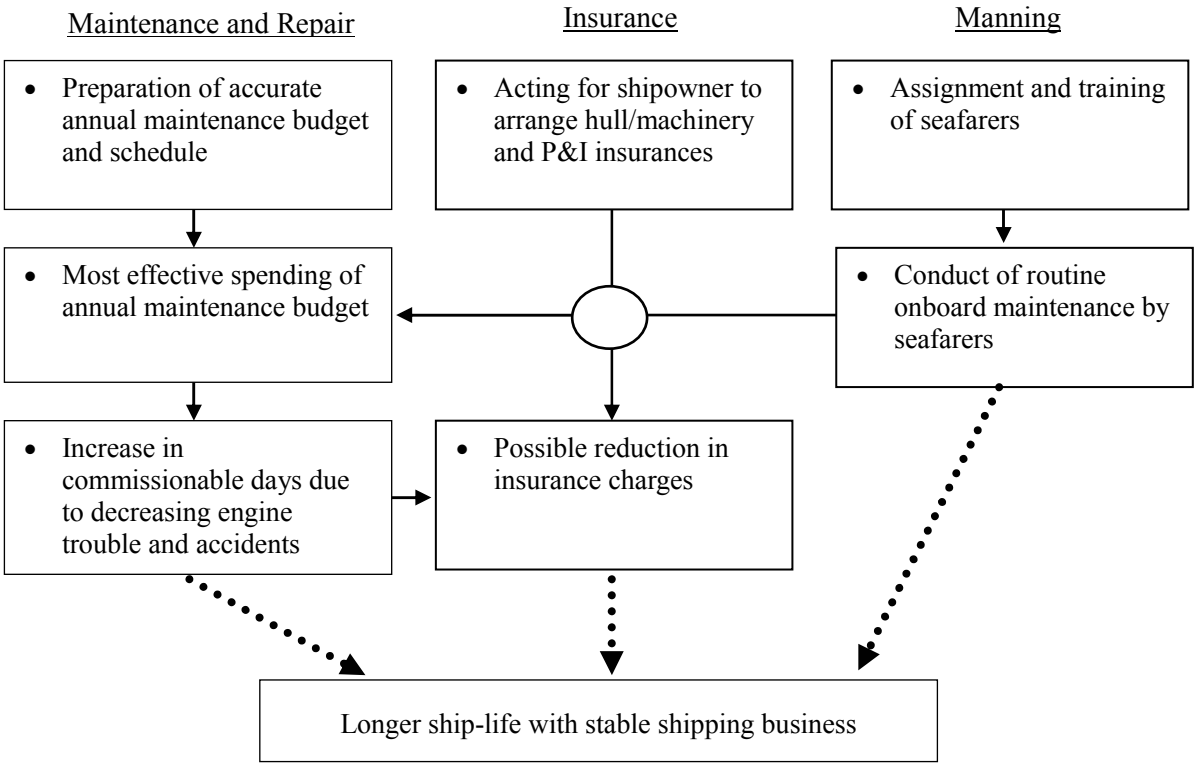
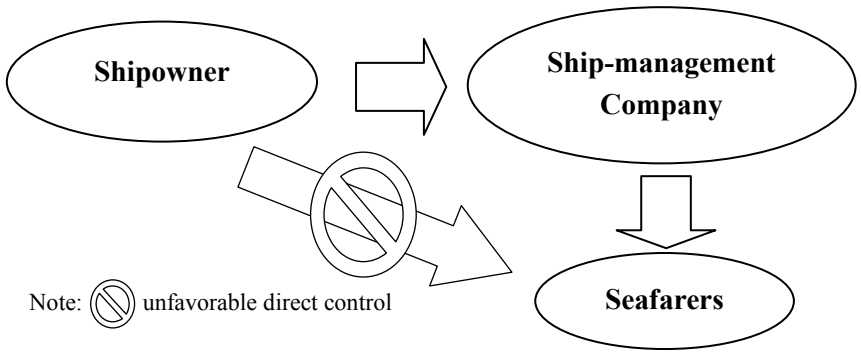


Figure 16.2.4 Conceptual Relation among Shipowner, Ship-management Company and Seafarers



16.2.2. Establishment of Ship-management Company

As a result of the previous section's analysis, it can be concluded that rapid and fundamental improvement is necessary for Indonesian domestic shipping management. The Study proposes to establish a ship-management company wherein experienced superintendents are employed. This section intends to clarify objectives, and functions of a ship-management company and its adequate regulatory framework and HRD measures.

(1) Concept and Functions

Professional ship-management services may become a viable business when shipowners contract out their ship-management works due to poor internal capability. In principle, a ship-management company provides services to ships through maintenance and repair, insurance arrangement and crewing (assignment and education). With such professional services, even small-scale shipowners are able to do their business within estimated maintenance budget and at optimal operation rate. Furthermore, appropriate ship maintenance contributes to extending the life of the ship significantly.

Superintendents shall take a central role in the ship-management company and are classified based on their experience. First is a senior superintendent who is in charge of the whole ship, and the other is a junior superintendent who does support and assistance for senior superintendents. (Refer to Figure 16.2.5)

(2) Regulatory Framework

Ship-management service is a new concept in Indonesia. DGSC informs the Study Team that the revised Shipping Law No. 21/1992, currently under preparation, may stipulate ship-management service as one of the recognized auxiliary shipping services (Chapter IX). Provided that ship-management service is a legally allowed service, the responsible authority must define it clearly with adequate guidelines to pave the way to introducing ship-management service in Indonesia successfully.

The Study proposes the following regulatory environments:

- Issuance of "ship-management company" license like freight forwarder license and other shipping auxiliary services;

- Issuance of DGSC decree on "ship-management company" guidelines in conformity with relevant international and domestic legal frameworks; and,
- Issuance of "superintendent" certificate to competent personnel after training and/or examination.

(3) Training of Superintendents

Superintendent is a new professional job in Indonesia. So far, a limited number of large operators employs such experts internally and contract out some ship-management services externally. Therefore, the scope and pace of superintendent's training will be a decisive factor to organize ship-management companies and provide their professional services over the country.

According to the next section's analysis concerning "A Model Ship-management Company", there is good balance between company size and operated fleet under the condition that 40 staffs including 5 senior superintendents manage 30 vessels of over 3,000 DWT/GT. With those assumptions, the number of senior superintendents, necessary for maintaining the domestic fleet, is 152 at present and 301 in 2024. Since there is none or very limited competent local superintendents in Indonesia, the government will need to extend its policy support to train about 300 senior superintendents during the Master Plan period. In this connection, "Section 17.1 Advanced Education in Shipping Industry" proposes a HRD program including superintendent training.

Table 16.2.1 Required Number of Senior Superintendents for Domestic Shipping

Year	2002	2014	2024
No. of Vessels over 3,000 dwt/grt [1/]	912	1,356	1,807
No. of Senior Superintendents [2/]	152	226	301

Note: 1/ Cargo vessels over 3,000 dwt and passenger vessels over 3,000 grt
2/ Workload assumption – 6 vessels per senior superintendent

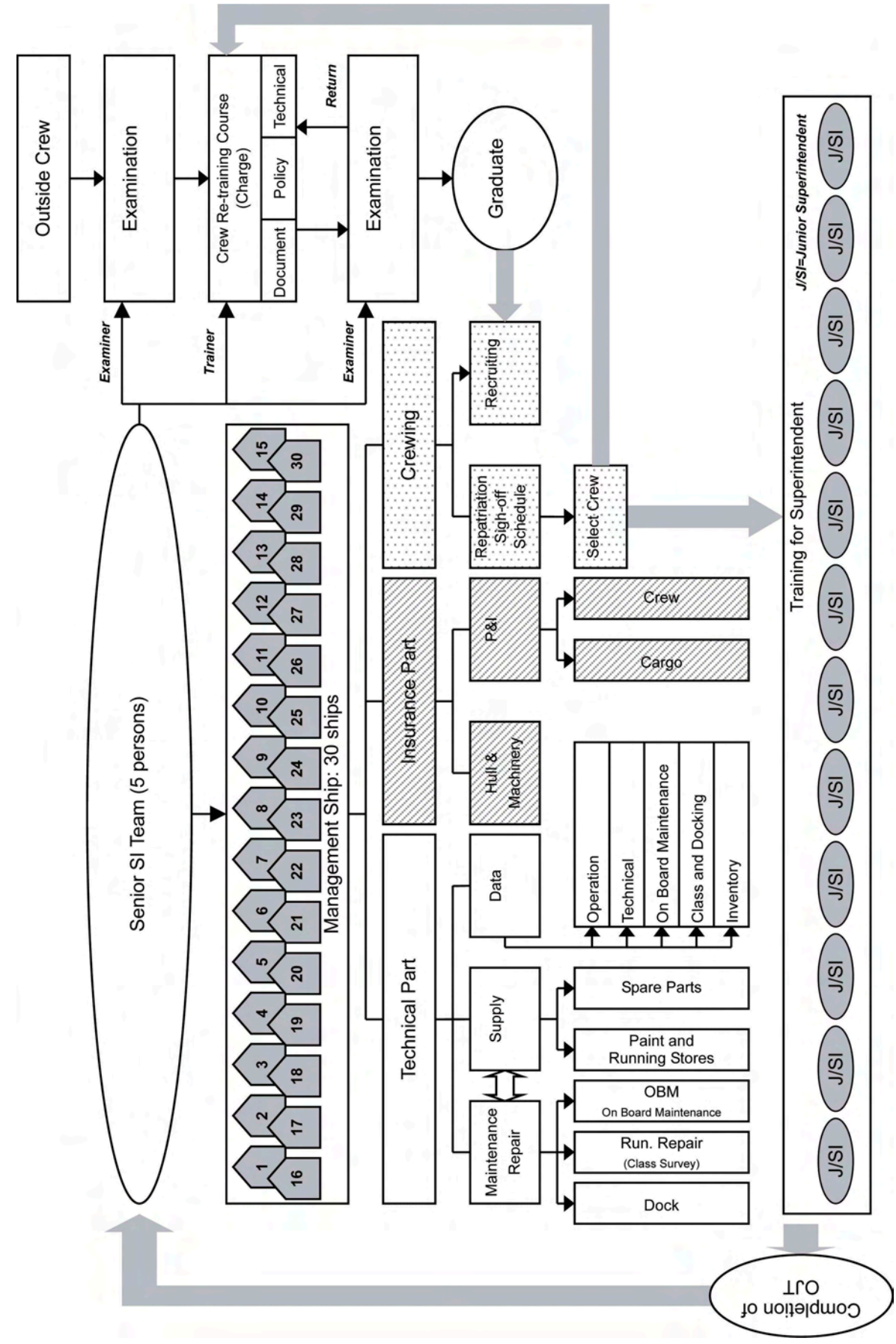


Figure 16.2.5 Operational Functions of A Ship-management Company

16.2.3. A Model Ship-management Company

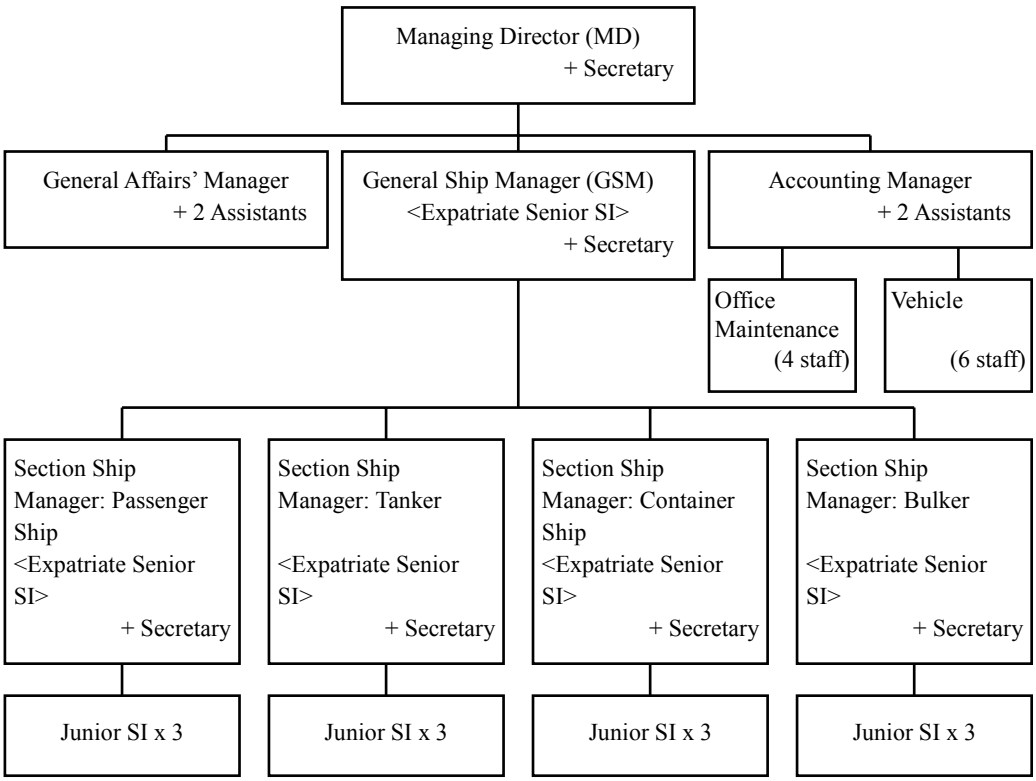
There are limited experiences to provide professional ship-management services to the domestic shipping industry in Indonesia. Therefore, this section conceptually sets up a Model Ship-management Company in order to check the balance between necessary input such as personnel and operation costs and expected incomes. In principle, the Model Ship-management Company has the following characteristics:

- A general company shall be duly established under relevant Indonesian laws (FDI up to 95% on equity).
- The company shall be run by 40 staffs including managers, superintendents and others.
- Due to limited business experience of ship-management in Indonesia, five expatriate superintendents shall be employed as senior superintendents during the initial period. Twelve (12) junior superintendents shall assist them while technology transfer shall be done on an O-J-T basis.
- Certain local shipowners shall contract out ship-management services to the company and in total 30 vessels with all over 3,000 DWT in size each.

The model company's organizational chart is illustrated in Figure 16.2.6. while its financial prospects (revenue and cost) is indicated in Table 16.2.2 to 16.2.4.

Figure 16.2.6 Organizational of A Model Ship-management Company

(Staffing Plan: 40 personnel)



Note: SI – Superintendent

Table 16.2.2 Financial Prospect of A Model Ship-management Company

Item	US$	Remarks
Total Revenue	1,800,000	US$ 5,000/month x 30 vessels
Total Expenditure	1,341,120	
Personal Cost	1,101,120	Refer to Table 16.2.2
Office Operation Cost	240,000	Refer to Table 16.2.3
Gross Profit Margin	458,880	
Enterprise Tax	134,702	Tax Rate (30%) on over Rp. 100 mil.
Net Profit	324,178	18.0% of total revenue

Table 16.2.3 Estimation of Personal Cost

(unit: US$)

Position	No. of Staff	Basic Monthly Wage	Yearly Multiplier*	Total
Managing Director	1	4,000	16	64,000
General Ship Manager	1	10,000	15	150,000
Senior Superintendent	4	9,000	15	540,000
Junior Superintendent	12	1,000	17	204,000
Manager	2	1,700	17	57,800
Assistant Manager	4	450	18	32,400
Secretary	6	280	18	30,240
Driver	6	150	18	16,200
Other Utility Persons	4	90	18	6,480
Total	40	-	-	1,101,120

Note: * inclusive of insurance, transportation and food allowance, bonus and others.

Table 16.2.4 Estimation of Office Operation Cost

(unit: US$)

Item	Monthly Cost	Yearly Cost	Remarks
Office Space	3,000	36,000	US$ 10/m^2
Communication	5,000	60,000	Including sea com.
Documentation	3,000	36,000	US$ 100/ship
Vehicle	6,000	72,000	US$ 1,000/car
Others	3,000	36,000	
Total	20,000	240,000	

The financial calculation indicates that the business seems viable if the company successfully services 30 vessels with an adequate management fee, i.e., US$ 5,000 per vessel. It can enjoy a net profit of 18.0% of revenue after enterprise tax is deducted.

Since the revised Shipping Law No. 21/1992 is going to legalize and promote ship-management services, this service will be promising where many ship-management companies may compete with each other. In order to discriminate services, in practice, some companies may be specialized in specific vessel types and others may concentrate on same home porting vessels. It is therefore required from the government to prepare a set of guidelines for establishing a ship-management company so as to deliver satisfactory services. It is believed that the Model Ship-management Company of 40 staffs taking care of 30 vessels, shows a good balance between service quality and reasonable price setting. When competent Indonesian superintendents are to replace expatriates, monthly management fees will be reduced to US$ 4,000. However, again, a much cheaper fee is unlikely to guarantee satisfactory professional services.

16.3. Project Assessment

16.3.1. Innovation of Fleet Design

In the previous section, new model ships that are most suitable in domestic maritime transport have been proposed. The most typical model to be assessed in this section is those applicable for shallow draft of river ports.

(1) Shallow and wide container vessel

Among the top 20 container routes, the candidate routes for the newly proposed ships are identified taken into account the draft condition of the ports as follows.

- Surabaya – Banjarmasin
- Tanjung Priok – Banjarmasin
- Banjarmasin – Makassar
- Balikpapan – Samarinda

All of these routes require additional container fleet to meet the demand growth as much as about 1.7 times of current DWT in total by the year 2009.

In order to examine the viability of the proposed ships, the following two cases are compared from the viewpoint of profitability.

Case 0: Ordinary container ship with maximum capacity is introduced.

Case 1: The Shallow and wide container ship proposed in this study is introduced.

The ports of Banjarmasin and Samarinda do not have sufficient draft to accommodate ships over 5,000 DWT. The typical maximum size is regarded as 3,000 DWT level for Banjarmasin and 5,000 DWT level for Samarinda. Therefore, these sizes are assumed to be adopted in Case 0, while shallow and wide container ship, C-125 type with 8700 DWT is assumed for Case 1.

In both cases, newly built ships are assumed to be applied. The analysis is also assuming same conditions by route for all the other influential factors such as operation speed, commissionable days, load factor and freight tariff etc.

As shown in Table 16.3.1, the result indicates that the proposed container ship (C-125) has higher profitability than the ordinary ship in any candidate routes, owing to the scale economy of loading capacity. Namely the revenue cost ratio of the new ship type becomes 5% to 10% higher compared with the ordinary ship. Accordingly the introduction of the proposed shallow and wide ship will be financially viable.

Table 16.3.1 Comparison of Cost and Revenue for Proposed Container Ship (C-125)

Route	Route1		Route2	
	Surabaya-Banjarmasin		Tg.Priok-Banjarmasin	
Ship Type	Ordinary container	C-125	Ordinary container	C-125
Distance(miles)	268	268	515	515
Ship size (DWT)	3000	8700	3000	8700
Speed (knot)	15	15	15	15
Commissionable days	346	346	346	346
Total days per RT	5.16	6.42	6.53	7.79
Total Nunmber of RT	67	54	53	44
Total Cargo Carried(TEU)	16,107	37,497	12,721	30,896
Capital Cost	6,480	16,800	6,480	16,800
Fixed Operation Cost(mil Rp/yr)	2,337	4,854	2,337	4,854
Distance related cost(mil Rp/mile)	2,158	2,310	3,276	3,658
Cargo related cost	5,315	10,499	4,198	8,651
Call related cost	295	442	233	364
Sub-total	16,586	34,905	16,524	34,327
Container perdiem	2,856	8,282	2,856	8,282
Total Cost/vessel yr (million Rp)	19,442	43,188	19,380	42,609
Ave.tariff(million Rp/TEU)	1.4	1.4	1.7	1.7
Total Freight Revenue (million Rp)	22,550	52,496	21,626	52,523
Revenue/cost	1.160	1.216	1.116	1.233
Route	Route3		Route4	
	Banjarmasin-Makassar		Balikpapan-Samarinda	
Ship Type	Ordinary container	C-125	Ordinary container	C-125
Distance(miles)	378	378	92	92
Ship size (DWT)	3000	8700	5000	8700
Speed (knot)	15	15	15	15
Commissionable days	346	346	346	346
Total days per RT	4.89	6.16	4.62	4.96
Total Nunmber of RT	71	56	75	70
Total Cargo Carried(TEU)	16,976	39,104	29,942	48,541
Capital Cost	6,480	16,800	9,600	16,800
Fixed Operation Cost(mil Rp/yr)	2,337	4,854	3,300	4,854
Distance related cost(mil Rp/mile)	3,208	3,398	923	1,027
Cargo related cost	5,602	10,949	8,983	13,591
Call related cost	311	461	461	572
Sub-total	17,939	36,462	23,267	36,844
Container perdiem	2,856	8,282	4,760	8,282
Total Cost/vessel yr (million Rp)	20,795	44,744	28,027	45,126
Ave.tariff(million Rp/TEU)	1.4	1.4	1.0	1.0
Total Freight Revenue (million Rp)	23,766	54,746	29,942	48,541
Revenue/cost	1.143	1.224	1.068	1.076

(2) Ro-Ro ship

A Ro-Ro passenger ship with shallow draft is also proposed in the previous section. Ro-Ro ship is characterized by its nature that trucks and other vehicles embark and disembark by their own power within short time at ports, therefore prompt cargo

delivery can be realized. Therefore, it may be mainly applied to relatively short distance transportation.

In the same fashion as C-125, the candidate routes are identified as follows considering the suitability of Ro-Ro ship and port draft conditions.

- Surabaya – Banjarmasin
- Tanjung Priok – Banjarmasin

For the purpose of financial analysis, again alternative cases are assumed as follows.

a. Case 0: Ordinary container ship with maximum capacity is introduced.

b. Case 1: The Ro-Ro ship proposed in the previous section is introduced.

As stated above, the representative ship for case 0 is the container ship with 3000 DWT. On the other hand, the Ro-Ro ship applied for case 1 has the characteristics of the relatively large units of vehicles and large number of passengers to be accommodated in spite of the shallow draft.

Likewise as the previous case, newly built ships are assumed to be applied in both cases.

In this analysis, same load factor, same speed, and same commissionable days are assumed. The only difference is the loading of cargo, capacity and passengers.

As shown in Table 16.3.2, the introduction of the proposed Ro-Ro ship will be financially profitable; however will not be superior to the ordinary container ship, even assuming the passenger load factor of 90%. In case of the proposed Ro-Ro ship, the revenue will increase as much as 2.4 times the ordinary container ship case, while the total cost increases as much as 2.6 times. This is mainly due to the higher capital cost of Ro-Ro ship.

If second hand Ro-Ro ship is introduced instead of the new Ro-Ro ship, the profitability will drastically increase and become higher than that of the ordinary container owing to the reduction in capital cost. In this case, the higher profitability will be attained even if the load factor of passengers drops from 90% to 35%.

Table 16.3.2 Comparison of Cost and Revenue for Proposed Ro-ro Ship (RP-150)

Route	Route1		Route2		Total	
Origin/Destination	Surabaya-Banjarmasin		Tg.Priok-Banjarmasin			
Ship Type	Ordinary container	Ro-ro Ship (RP-150)	Ordinary container	Ro-ro Ship (RP-150)	Ordinary container	Ro-ro Ship (RP-150)
Distance(miles)	268	268	515	515		
DWT or GT	3,000	18,000	3,000	18,000		
Speed (knot)	15	15	15	15		
Comm days	346	346	346	346		
Total days per RT	5.16	4.66	6.53	6.03		
Total No of RT	67	74	53	57		
Total Cargo Carried(TEU or Unit)	16,107	183	12,721	183		
Ship Price (million Rp)	54,000	230,000	54,000	230,000	108,000	460,000
Capital Cost	6,480	27,600	6,480	27,600	12,960	55,200
Fixed Operation Cost(mil Rp/yr)	2,337	4,500	2,337	4,500	4,674	9,000
Distance related cost(mil Rp/mile)	2,158	2,549	3,276	3,784	5,434	6,333
Passenger related cost	-	6,421	-	4,959	-	11,381
Cargo related cost	5,315	-	4,198	-	9,513	-
Call related cost	295	609	233	471	529	1,080
Sub-total	16,586	41,680	16,524	41,314	33,110	82,994
Container perdiem	2,856	-	2,856	-	5,712	-
Truck perdiem	-	8,030	-	8,030	-	16,060
Total Cost/vessel yr (million Rp)	19,442	49,710	19,380	49,344	38,822	99,054
Ave.tariff(million Rp/TEU or /Unit)	1.4	2.6	1.7	2.6		
Passenger Revenue(million Rp)	-	17,962	-	26,659	-	44,621
Cargo Revenue(million Rp)	22,550	35,361	21,626	27,311	44,175	62,672
Total Freight Revenue (million Rp)	22,550	53,323	21,626	53,970	44,175	107,293
Revenue/cost Ratio	1.160	1.073	1.116	1.094	1.138	1.083

(3) Concluding Remarks

The above financial analysis suggests the following points.

- The shallow and wide container ship is significantly effective for domestic shipping in Indonesia, where many shallow draft ports exist. Therefore, ship building scheme is hopefully materialized as soon as possible.
- In accordance with the economic growth, higher value commodity is likely to increase, which requires more speedy transportation from door to door. Ro-Ro ship is corresponding to this demand. Although the above financial analysis does not show the preferable performance of newly built Ro-Ro ships, the economic growth will change the economic conditions such as the structure of tariff rate.
- Therefore, the proposed Ro-Ro ship is also worthwhile to be analyzed more in detail. Particularly the improvement or reformation of existing ships might be effective so as to minimize the capital cost at the initial stage.

16.3.2. Ship-management

By contracting out the ship-management services to the ship-management company, ship owners will be able to expect more efficient ship operation and maintenance, which will bring about the following benefits.

- The annual average commissionable days of the ships will increase owing to the proactive maintenance system as well as the reduction of mechanical or other

physical troubles.

- The ship life will be substantially extended as a result of more adequate ship management.
- The operation efficiency of the ships will improve in terms of speed, fuel consumption etc.
- The reduction of accidents or malfunctioning will reduce repair cost and eventually result in the reduction of insurance cost.

As explained in the previous section, the ship-management company will be sustainable if the monthly ship-management fee of US$5,000 per ship is acceptable to ship-owners. Accordingly the financial viability will be further examined regarding the management fee for a shipping company in this section. For this purpose, the profitability will be compared between the two cases with and without ship-management companies.

(1) Conditions for the financial analysis

a. The ship-management fee is assumed as US$ 5,000 per month per ship
b. In return, the commissionable days will increase from the current average 346 days to 359 days for container ship and 338 days to 359 days for conventional ships.
c. The ship life is assumed as 30 years without the ship-management contract. It is generally said that the ship life can be extended up to five or ten years if the ship is appropriately maintained. Hence, it is also assumed that the life will be extended by as long as 20% more than remaining ship life at the time of contract. For instance, if the ship age is 10 years old at the time of contract, the ship can be operated until it is 34 years old; and is the ship age is 20 years old at the time of contract, the ship can be used until it is 32 years old.
d. The ship speed will increase as much as the life is extended, assuming a certain relationship between ship age and operation speed by ship type. For instance, if the additional extended life is 2 years, the ship speed becomes same as that of 2 years younger ship.
e. The daily maintenance cost will increase, however it will be offset by the reduction in the repair cost and insurance cost.

(2) Financial analysis

Table 16.3.3 shows the comparison of the two cases of “with” and “without” the ship management contract. As a model ship for the simulation, a container ship with 10,000 DWT of 20 years old is assumed. In case of “with” contract, the total operation cost will increase due to increase in round trip. In addition, the ship management fee will be added to the operation cost; however, the revenue increase is much higher than the incremental cost. The net operating profit will therefore, increase compared to the “without” contract case. In this simulation, the profit in the case of “without” contract is 16.7 billion Rp, while that in the case of “with” contract is 19.4 billion Rp.

In addition, the ship life will be extended as much as 2 years in the case of “with” contract owing to good ship maintenance. Consequently difference in the accumulated profit during the rest of the ship life will theoretically become much bigger as illustrated in Figure 16.3.1 .

Table 16.3.3 Profitability for the cases with and without ship-management contract

Container 10000DWT	Age : 20yrs old	
	without	with
Typical Distance (mile)	585	585
Speed (knot)	14.0	14.6
Commissionable days	346	359
Average waiting time at port (hr)	12	12
Cargo handling speed (TEU/hr/gang)	10	10
Load factor	0.5	0.5
Cargo weight capacity (MT)	8,000	8,000
Days on the sea	3.48	3.34
Days at port	2.78	2.78
Total days per Round Trip	6.26	6.12
Total Number of Round Trip	55	59
Total Cargo Carried (mil ton)	0.44	0.47
Fixed Operation Cost (mil Rp/yr)	32,920	32,920
Distance related cost (mil Rp/mile)	4,635	4,875
Cargo related cost (mil Rp)	11,497	12,208
Call related cost (mil Rp)	532	565
Sub-total (mil Rp)	49,583	50,568
Management Fee (mil Rp/yr)	0	504
Total Cost (mil Rp)	49,583	51,072
Freight/TEU (mil Rp)	1.5	1.5
Annual Revenue (million Rp)	66,327	70,429
Profit	16,744	19,357

Figure 16.3.1 Theoretical Accumulated Profit during the Ship Life

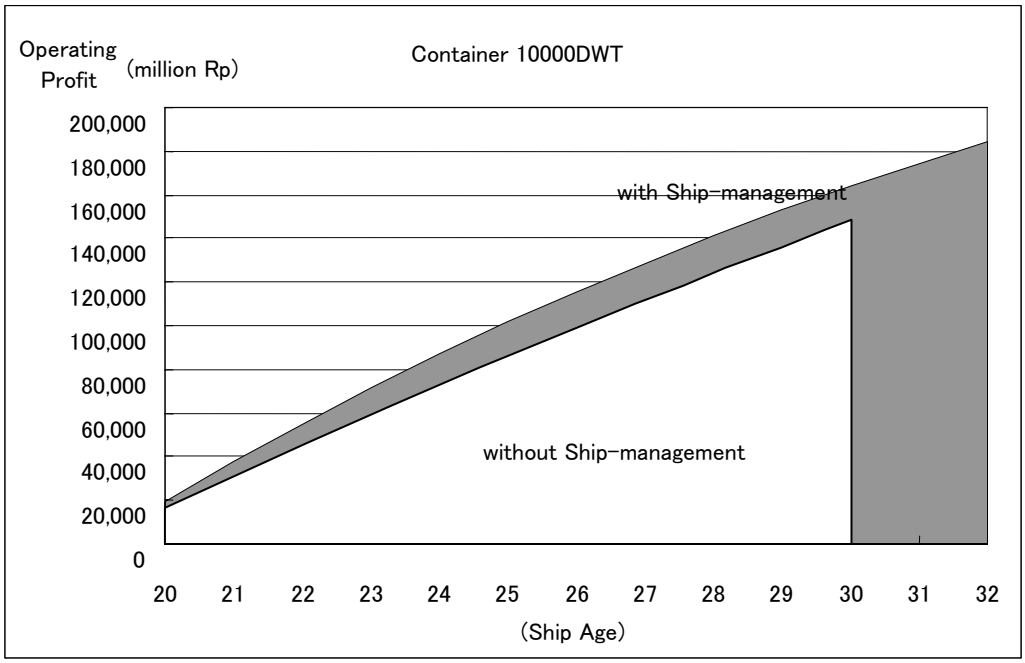
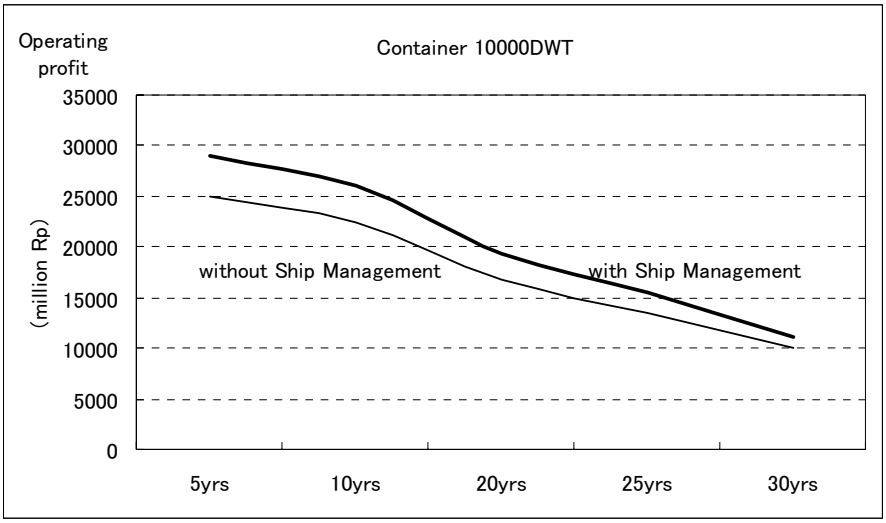


Figure 16.3.2 shows the changes of profitability "with" and "without" the ship-management contact for various ages of container ships with 10,000DWT. In accordance with the ship age, the advantage due to ship-management will diminish because the extended life becomes shorter as the age of the vessel at the time of contract increases.

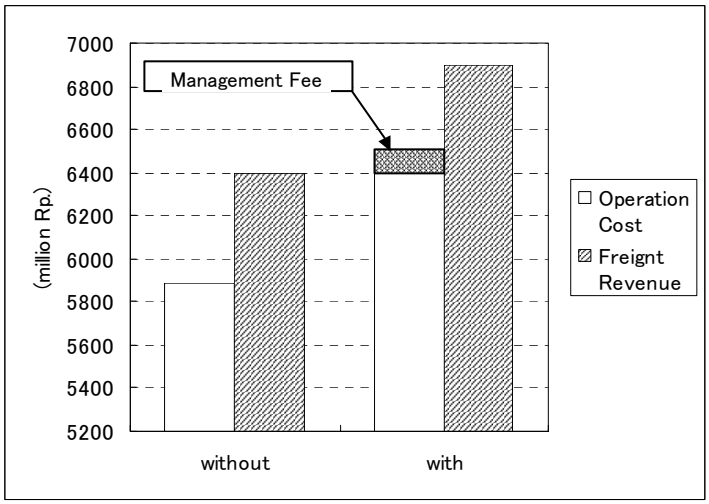
Figure 16.3.2 Profitability by Container Ship Age



Likewise, in case of conventional ships, the profitability of the "with" ship-management contract case is generally higher than the "without" case. In the case of conventional ships with 5000 DWT of 20 years old, the revenue increases as much as 736 million Rp, while the operation cost increases as much as 159 million Rp. Therefore the incremental revenue, i.e., 537 million Rp, barely exceeds the ship-management fee.

In the case of the conventional ships with 3000 DWT of 20 years old, however, the incremental profit can no longer cover for the ship-management fee as shown in Fig 16.3.3. Therefore, the profitability may decrease if the ship-management fee is added. This is because the efficiency improvement due to the ship-management is too low. It indicates that the ship size should be bigger than 3000 DWT in case of conventional ships, otherwise profitability may have a possibility to decrease.

Figure 16.3.3 Profitability of Conventional Ships with 3000 DWT



(3) Concluding Remarks

From the above analysis, the following suggestions are extracted.

- The proposed Ship-management system has a possibility to bring about a large amount of benefits to the shipping industry. It may increase the operation efficiency of ships and extend the ship life and with improved conditions; therefore, it will increase the profitability of shipping companies, and consequently may contribute to fleet renovation.
- In the above analysis, the Ship-management will be effective particularly for large size vessels of more than 3000 DWT. In case of small size ships, therefore, another system should be considered including lower management fee.
- The above profitability increase is brought about, based on the various assumptions such as: higher commissionable days, extension of ship life etc. However, these are based on the premises that the proposed ship-management system functions well in terms of ship inspection and maintenance, crew training etc. For this purpose, establishment of reliable ship-management company and changes in the ship owner's company policy from short-term ship management to long-term ship management will be important.

Chapter 17

CAPACITY BUILDING FOR MARITIME TRANSPORT

17. CAPACITY BUILDING FOR MARITIME TRANSPORT

17.1. Advanced Education in Shipping Industry

17.1.1. Rationale

A major problem in the shipping industry in Indonesia is characterized by the dominant number of second-hand aged vessels in poor maintenance and poor operation. Remedial measure for this problem is to improve management of shipping companies, renew the vessels and modernize the industry. Renewal of vessel requires financial support which can be made possible only when financial performance of shipping companies is improved.

Management improvement is led by effective managers who make optimum allocation of resources including physical, financial and human asset. Therefore, development of management class human resource is a key to the future of the shipping industry, including ship-management as a profession. In addition, the level of expertise of administrators is important in ensuring that the environment is conducive for modernization. It is thus evident that management in both shipping and shipbuilding industry is a constant issue in the industry's development. It is thus proposed by this Study to initiate an advanced education center or program to enhance the managerial and administrative human resources of the shipping industry.

17.1.2. Basic Concept

The proposed program deals with management level personnel in the maritime industry to develop their expertise and management ability to become leaders in both private and public sector activities. The program includes the following four (4) study areas which are categorized into expert course and management and administration course.

Expert course

- Ship-Management studies which develops superintendents and managers of companies.

Management and administration course

- Administration and legal studies aimed at developing capable officers who will be able to interpret legislation and be able to draft regulations.
- Management studies in shipping business which develops operational managers and managers of shipping companies.
- Shipyard management studies aimed at developing supervisors and managers of shipyards.

As a prerequisite for all courses, every participant should complete units in quality management and process management. In these courses, participants both learn the theories and practice of Total Quality Management (TQM), ISO 9002 and project coordination.

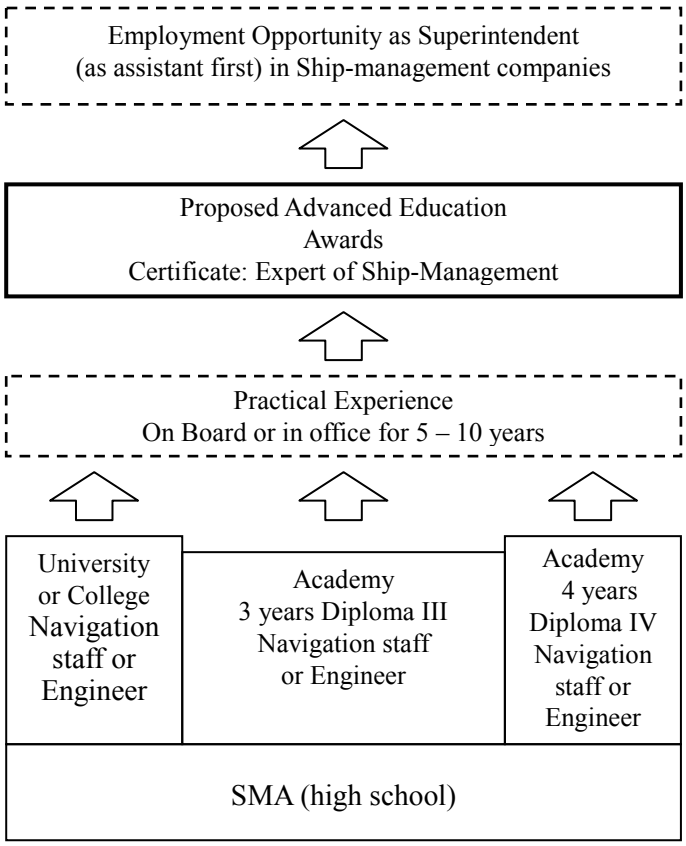
In addition these courses will develop the ethics of managers as well as their appreciation and understanding of the society and the environment. The courses will include inter-curricular activities to associate participants with business and industry leaders through seminars and field trips to shipping companies.

The center is expected to be initiated with the assistance of existing institutions. The supervising agency is envisioned to be the Department of Communication, Education and Training Agency (ETA) and the Directorate General of Sea Communications (DGSC). In addition, discussion with the Ministry of Education will be important for the creation of a new certificate of ship-management and a master's degree in management of maritime business which is equivalent to Strata 2.

17.1.3. Two Career Tracks

The education program will provide two types of certificates related to the career tracks of participants. One is a course to develop professional skills in ship-management. Graduates with diploma III or higher and 5 to 10 years' practical experience will be deemed eligible for this course. At the completion of this course, certificate as an "Expert of Ship-management" will be awarded and employment as assistant superintendent will be prepared in a ship-management company (which is an item of STRAMINDO action plan.)

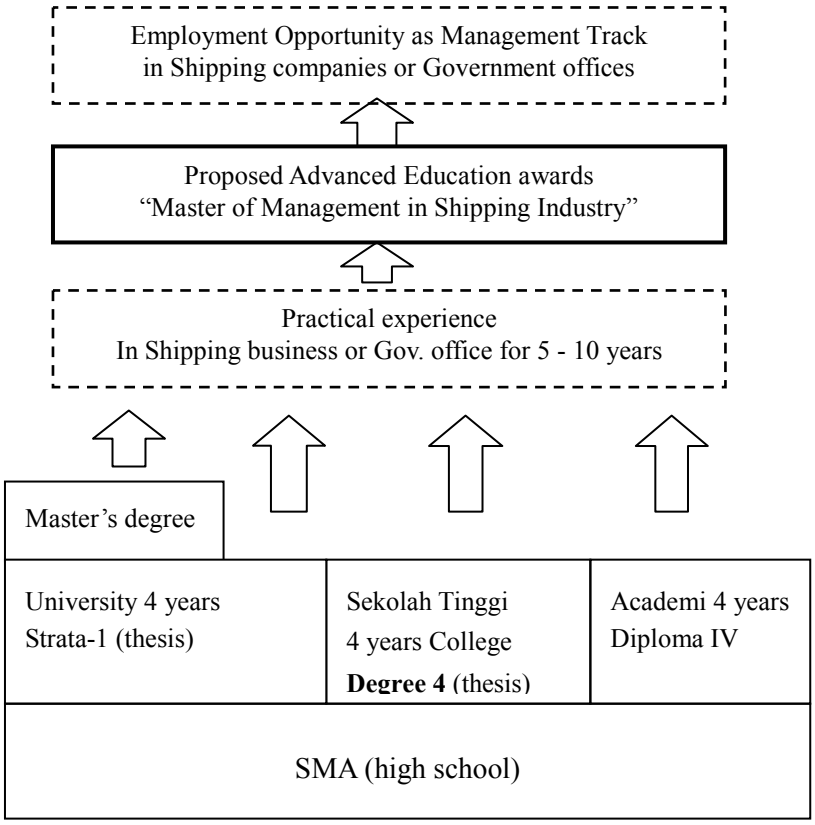
Figure 17.1.1 Expert Course for Ship-Management



Another course is to develop people for administration and management. For this course, minimum requirements for eligibility will be a college degree and 5 to 10 years' practical experience. A

Masters Degree in Management in Maritime Industry will be awarded and job opportunities will be opened as managers or operation managers in shipping companies, or as administrators in government offices.

Figure 17.1.2 Management Higher Education system



17.1.4. Platform Institution

In order to implement this program, stakeholders will discuss and decide the executing agency, as the platform institution, from among the existing educational institutions under ETA such as Stepping and Skill Training Course for Sea Communication Employee (BPPTL). It is also possible to appoint a private university to set-up a new school of management and put it under the supervision of ETA, Ministry of Communication.

After the initial stages of operation, this education center is intended to operate in a financially independent manner. Therefore, operational expenses will be covered by the tuition paid by the participants. Private companies will be encouraged to send their employees for management training or to support a scholarship fund in order to develop capable individuals for the maritime industry.

Because of the nature of this advanced education center, students are called participants. It is hoped that shipping companies will select future management candidates and send them to this center with financial support.

(1) Institutional Framework for the Course of Ship-management

For the expert course of ship-management, the ETA is considered responsible for implementing the proposed scheme. Among the educational centers under ETA, one will be selected as the executing agency for this purpose. Administration and operations are all delegated to the appointed executing institution, and the program will be supervised by the ETA.

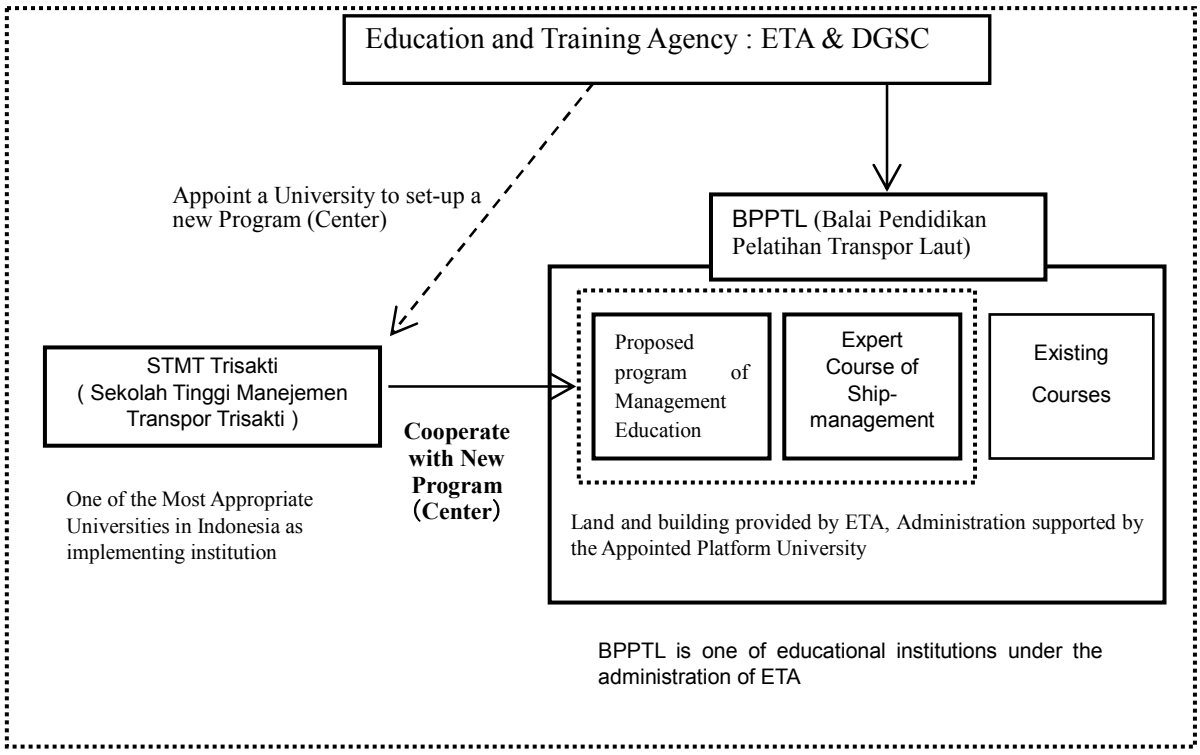
Based on the discussion with ETA and DGSC, the proposed new expert course will be prepared as a diploma course.

(2) Institutional Framework for Advanced Management Education

For the advanced management education, ETA and DGSC will jointly select a university from a wide range of educational institutions, and the most favorable university is contracted for establishing a new center by joint venture with ETA. The process of selection might be a proposal bid by universities. The ETA will contribute land and buildings whereas the selected university, as the executing agency, provides administration services and sets up the school program and professors.

Based on the current educational system, a new management school will be prepared to offer a master's degree course (Strata 2).

Figure 17.1.3 ETA & DGSC Establish a Course of Management by Contract



17.1.5. Course preparation

Based on the policy and concept of the center, course curriculum is going to be prepared according to the following table. Participants are recommended to take major classes (marked A in the table) and some elective classes (marked B).

Table 17.1.1 Course Menu at Advanced Education and Training Center

	Superintendent for Ship-management	Administrator	Business Manager	Operation Manager	Shipyard manager	Visiting Specialist
Mandatory Courses for all Participants						
M-1 Total Quality Management & ISO 9002	A	A	A	A	A	B
M-2 Process Management & Project Coordination	A	A	A	A	A	B
Ship-Management [Expert Track]						
B-1 Planned Maintenance and Procurement	A				B	B
B-2 Technical Management for Ship Operation	A	A	B			B
B-3 Budget Control Accounting and Reporting	A		B	B		
B-4 Organization, Human resource management	A			B		
Administration & Government Mandate						
D-1 Legal issues and Maritime Administration	B	A	B	B	B	
D-2 Insurance (concept and practice)	B	A	B	B	B	
D-3 Environmental Issues in Maritime Industry	B	A	B	B	B	
D-4 Port Management and Development Planning		A		B		
Shipping Business Management						
A-1 Business Management and Marketing			A	B		B
A-2 Logistic system and Economics			A	A		B
A-3 Operation Planning, Costing and Accounting			B	A		
A-4 Finance and Risk Management			A	A		
Repair & Shipyard Management						
C-1 Repairing and Ship Building Supervision					A	B
C-2 Procurement Management					A	
C-3 Human factors for safety and productivity					A	B
C-4 Innovation Management					A	B
Interdisciplinary Approach						
E-1 Case Studies of Business Development	B	A	A	A	B	B
E-2 International Trend and Land Transportation	B	A	A	A		A
E-3 Field Work and OJT		B				A
E-4 Conventions and Symposium	C	C	C	C	C	A

Note: A: strongly recommended,
B: recommended
C: encouraged to participate even after graduation
+ Superintendent is an On-Board Maintenance Engineer

The four courses offered by the center deal with the study areas both extensively and profoundly. Preparation for these courses includes various teaching materials such as textbooks and computer software. It is therefore proper to consider the start of operation in several stages.

The modernization of the maritime industry depends on effective ship-management so that vessels should comply with international standards by realizing the economy and safety in operation. Effort should be made to build a strong institutional framework so that the ship-management will be supported properly, especially with some intervention and support from the government. It is recommended that the participants are encouraged to study the basic technical and legal subjects besides their major field of studies.

17.1.6. Faculty members for the Ship-Management course

One of the most important elements of this educational center is to procure good teachers. There are several possibilities in identifying faculties. The *first* are professors and lecturers in one of the current maritime colleges such as STIP Jakarta, PIP Semarang and PIP Makassar. *Second* are managers of leading companies in Indonesia. Managers could bring a high level of practical knowledge to the courses. *Third* are superintendents and managers of international ship-management companies active in Asia including Japan. *Fourth* are designers and marketing managers of manufacturing companies of engine or spare parts and materials. The intention is to be able to bring insight of field experience and in-depth understanding of the importance of using right material and parts.

Possible lecturers above are compared based on eligibility, resource availability relating to the lecturers, and remuneration. The result of the comparison as shown in the following table indicates that managers from private companies in Indonesia; and, superintendents of international ship-management companies are considered to be very favorable.

Table 17.1.2 Evaluation of Possible Lecturers

	1. Professor of other Indonesian Academies	2. Manager from Private company in Indonesia	3. Superintendent and Manager of International Ship-management co.	4.Designers from Manufacturing Companies
Teacher Eligibility				
Up-to-date Proficiency	Not Easy	Very Good	Good	Good
Teaching Technique	Good	Good	Very good	Good
Language Barrier	Indonesia	Indonesia	English Base	English Base
Mutual understanding with student	Maybe	Possible and good	Possible and good	Possible
Resource Availability				
Availability of teacher	Available	Not Easy	Possible	Possible
Full-time or Part-time	Possible	Part-time	Part-time	Part-time
Network resource	Possible	Good	Good	Possible
On-Site Training				
On-Board training	Difficult	Possible	Possible	Possible
On-site training	Difficult	Possible	Possible	Possible
Administration & Management				
Fee Level	Various	Expensive	Expensive	Reasonable
Arrangement easiness	Various	Limited time	Limited time	Possible
Leadership by Lecturer	Possible	Possible	Possible	Less expectable
Overall Evaluation	**Favorable**	**Very Favorable**	**Very Favorable**	**Favorable**

Evaluation comments are based on the consideration of the situation in Indonesia and subjective judgment of the study team consultants with information gathered from various sources both public and private.

17.1.7. Effect and Certificate: Quality Assurance of Graduates

The impact of this education center will be evident when graduates return to their respective companies or agencies and implement what they have learned. Participants are encouraged to teach what they have learned to their co-workers.

The effect of better educated and trained managers graduating from the center and returning to the companies/agencies will result in increase of profits. In this respect, graduates are considered as important evidence of the quality of the center. Reputation of the center will depend on the performance of the graduates.

At the same time, there should be an effort to certify the quality of education besides the certificate of graduation. World Maritime University invites professors in Europe and conduct examination to demonstrate that their students have a high level of understanding and capabilities equivalent to graduate courses of other maritime universities in Europe. Similar evaluation procedure would be valid if it receives international recognition from ASEAN countries.

17.1.8. Stages of Implementation and Faculty Size

This action plan proposes to focus on the ship-management course as the first stage. Then the administration and legal studies course and the shipping business management will be introduced as the second stage. Finally as the third stage, the shipyard management course will be offered. Each stage will be started after 2 or 3 years of preparation period.

Table 17.1.3 Faculty and Staff Planning in three stages

	Stage-1 (First 2 Years)				Stage-2 (Next 2 years)				Stage-3 (5th yr onward)			
	Prof	Vist Le	Staff	Total	Prof	Vist Le	Staff	Total	Prof	Vist Le	Staff	Total
Mandatory Courses for all Participants			1	3			1	3			1	3
M-1 Total Quality Management & ISO 9002	1	1			1	1			1	1		
M-2 Process Management, Project Coordination												
Shipping Business Management				0			2	6			2	6
A-1 Business Management and Marketing						2				2		
A-2 Logistic system and Economics					1				1			
A-3 Operation Planning, Costing, Accounting						1				1		
A-4 Finance and Risk Management												
Ship-Management			2	5			2	6			2	6
B-1 Planned Maintenance and Procurement		1				2				2		
B-2 Technical Management for Ship Operation	1				1				1			
B-3 Budget Control Accounting and Reporting		1				1				1		
B-4 Organization, Human resource management												
Repair & Shipyard Management				0				0			2	6
C-1 Repairing and Ship Building Supervision										2		
C-2 Procurement Management									1			
C-3 Human factors for safety and productivity										1		
C-4 Innovation Management												
Administration & Government Mandate				0			2	6			2	6
D-1 Legal issues and Maritime Administration						1				1		
D-2 Insurance (concept and practice)					1				1			
D-3 Environmental Issues in Maritime Industry						2				2		
D-4 Port Management, Development Planning												
Interdisciplinary Approach			1	1			1	2			1	3
E-1 Case Studies of Business Development											1	
E-2 International Trend and Land Transportation												
E-3 Field Work and OJT							1				1	
E-4 Conventions and Symposium												
Total Administration Office Clerk			2	2			2	2			2	2
Total	2	3	6	11	4	10	11	25	5	13	14	32
Course Menu	Ship-management				Ship-management Course Business management Administration Course				Ship-management Course Business management Administration Course Shipyard Management			

17.1.9. Organization of Implementation

It is important to select a good institute to make as a platform, or otherwise it is necessary to start with a new organization. The concept of this center needs to be understood with maximum flexibility and faculty's ability to widen participant's horizon.

For the start up of the center, it is assumed that approximately one and a half years of preparation period is estimated to be necessary even by separately contracting projects for preparation of text and teaching materials. Expected preparation board members are listed as follows.

1. Chief Representative Officer Appointed by ETA
2. Members of preparation board
   (1) Expert in the education of quality management and project coordination
   (2) Expert in Ship-management: Superintendent in ship-management company
   (3) Expert in Shipping Business and Marketing: Company manager who has experience in management
   (4) Expert in Operation Management

(5) Expert in Maritime Administration

(6) Coordinator (two persons)

Even though the operation needs to be self-supporting, it is expected to employ one foreign expert and additional support for instructor training for the start up of the center. As a reference, the National Center for Transportation Studies (NCTS) in Philippines was aided by a six-member team of Japanese experts for five (5) years during the implementation phase from 1992 to 1997, and followed by additional two years of continuous support. Personnel who participated in the project amounts to 24 long term experts, including 5 experts from countries other than Japan, and 23 short term experts.

17.1.10. Preparation for operation – Steps and Schedule

When ETA and DGSC decide to implement this program, it is good to start with a detailed survey and planning, taking approximately 6 months. The survey and planning team will make a fair judgment of the potential to operate the maritime management education program. Together with this survey and planning team, ETA and DGSC will act as the counterpart agency to start the necessary arrangement of location, fund procurement planning, and procurement of faculty members.

After confirmation from the survey and planning team and counterpart agency, funds to deliver governmental support for the preparation of teaching material will be expected to be set up at the beginning of the new fiscal year. Counterpart agency will start recruiting teachers and lecturers, and invite potential faculty members to discuss about teaching materials.

After teaching materials are done, preliminary operation using these materials will be started by both lecturers and experts who will be called in to work to improve and refine the teaching materials. As these preliminary operations are conducted, teaching materials are checked and revised.

During the course of preparation of teaching materials and preliminary operation, instructors will be given the opportunity to train and be familiar with the materials. Foreign experts are expensive to hire even as part time, so instructors should be developed within the program. Candidates will be sought from faculties and managers of shipping companies. After the school starts, good participants will be considered as potential hire as instructors.

During the period of pilot testing, application for entrance in the center will be distributed and selection process including interview is to be made for the first semester.

Table 17.1.4 Schedule of Preparation until the Opening (by quarter of year)

	Year 1				Year 2				Year 3			
	1-Q	2-Q	3-Q	4-Q	5-Q	6-Q	7-Q	8-Q	9-Q	10-Q
Survey and Detail Planning										
Discussion on Accreditation										
Organizational arragement of ETA										
[Preparation of Teaching Material]										
Recruiting Teachers & Instructors										
Preliminary operation & Adjustment										
Student Selection										
1st Semester onward										

Note: at earliest, Year 1 is 2004

For the preparation of Expert course of Ship-management, it might be suggested to prepare in one year and start as pilot course in cooperation with leading shipping companies in Indonesia so that the course contents could be examined. The following fast track program is the option to start in the earliest.

Table 17.1.5 Fast Track Preparation for Ship-management Course (by quarter of year)

	Year 1	Year 2	Year 3
Survey, Detail Planning			
Discussion on Accreditation with MOE			
Organizational Arrangement of ETA			
Recruiting Teachers & Instructors			
Preparation of Teaching Material (Advanced)			
Preparation of Teaching Material (Basic)			
Preliminary Operation & Adjustment			
Student Selection			
1st Year			
1st Graduate			★
BPPTL New Campus			
Other Training Facilities Ready for Use			

17.1.11. Financial Estimation for the Investment and Operation

(1) Cost estimation for preparation of facilities

(a) Initial investment for facilities

Initial investment on classrooms and facilities vary according to the platform institution. When the University of Indonesia or STIP is selected as platform institution, and the existing facilities can be utilized for this extension courses, initial investment can be very small. Whereas in the case of setting up a new institution; a reasonable amount of investment should be prepared for classroom and computers. However, management education does not rely on machinery, but rather discussions and on-site training is more important.

As typical facilities for management education, the following facilities are assumed to be provided from the government or platform institution. These facilities can be a renovation of existing buildings and not necessarily be new.

Table 17.1.6 Facility type and estimated cost of investment over initial 5-year period

6 classrooms + office space	4.0 Billion rupiah
Auditorium for 300 people	2.5 Billion rupiah
Laboratory + Library	2.3 Billion rupiah
Total Estimated cost of Land & Building	**8.8 Billion rupiah**

Resident faculties and office staff are assumed to use computers for administration work. As the number of staff increases the number of needed computers will increase as well. Computers will need to be replaced after 5 years so that renewal purchase is necessary every 5 years. (Please refer to the attached calculation table for detail of calculation)

(b) Production of Teaching Materials as Separate Project

Teaching materials including textbook and software can be packaged as one project and delegated to a capable group of experts by open tender. A rough estimate indicates a cost of 5.4 billion Rp for the assignment period of 6 months.

Initial survey/research and arrangement of the educational institution together with ETA and DGSC should be conducted by experts who know international cooperation and maritime business.

(2) Financial Plan of Operation

Apart from initial investments, sustainability in operation should be examined under the concept of financial independence after the initial stage of a few years.

Based on the current level of tuition and salary of professors, financial viability of the center is examined.

(a) Tuition as revenue

The amount of tuition including miscellaneous fees is set at 8 million Rp per semester based on the following current level of other institution.

Table 17.1.7 Tuition at University of Indonesia

Undergraduate (Regular student)	7	Mil. Rp/semester
Master course	8	Mil. Rp/semester
Doctor course	10	Mil. Rp/semester

(b) Salary and wages of professors and visiting lecturers

Monthly salary of professors ranges from 3 million Rp in STIP to 5 million Rp in STMT TriSakti. Thus, a 5 million monthly salary plus 1 million Rp transportation and meal allowance, is assumed.

Visiting lecturers' wage ranges from 25,000 to 35,000 Rp per hour. Considering that managers in private companies will be invited, hourly wage is set at 50,000 Rp. Lectures takes about 2 hours per one session and is conducted twice a week, for 15 weeks per semester. In addition transportation allowance is given at 40,000 Rp per week. As a result, total wage payment for a lecturer amounts to 3.6 million Rp per course per semester.

(c) Salary of administration staff

Good administration staff is important. Therefore the salary is set a little higher than the average level of universities. High ranked staff (or administration staff A) is assumed to receive 2.5 million Rp and transportation and meal allowance of 1 million Rp. Assistant level staff (administration staff B) is assumed to receive 1 million Rp salary and transportation and meal allowance of 1 million Rp per month.

(d) Tax payment for salaries

Tax duties for employees' salaries and wages are assumed based on the current levels of 5% for annual salaries ranging between 25 and 50 million Rp, and 10% for salaries ranging from 50 to 100 million Rp.

Table 17.1.8 Tax duty ratio by salary bracket

Annual salary payment	Rate of tax duty paid by the employer
25 mil < salary portion < 50 mil	5%
50 mil < salary portion < 100 mil	10%

(e) Direct administration expenses for operation

Direct administration expenses are assumed to increase according to the increase of participants for their use of facilities and recruitment. Communication with professors and lecturers are also considered to increase as the number of courses increase. Following table indicate the unit expense of these items.

Table 17.1.9 Direct cost of Administration

Water & Electricity	0.2 million Rupiah / participant
Telephone	1.0 million Rupiah / faculty
Publications & Printing	0.3 million Rupiah / participant
Maintenance cost of facilities	0.2 million Rupiah / participant

(f) Sustainability of Operation

Based on the calculation of revenue and expenses, single year cash balance is calculated. The result indicated that the initial 2 years after the opening of the center

will be in deficit but after that the cash balance will turn to positive so that additional investments will be covered.

The level of tuition will be adjusted according to the inflationary increase of operational cost so that the profitability will be maintained. In this base case calculation it is assumed that there will be 20 participants though the capacity of the center is good for up to 25 participants. Therefore the cash balance indicated here is a conservative estimate. Additional revenue will be a direct profit to the center.

Table 17.1.10 Single Year Cash Balance

(mil Rp)

Year	-2	-1	1	2	3	4	5	6
Operation Expense Total	86	336	438	438	885	885	1,108	1,108
Revenue by Tuition	0	0	320	320	960	960	1,280	1,280
Balance (Base Case)	**-86**	**-336**	**-118**	**-118**	**76**	**76**	**172**	**172**

The base case assumes 20 participants out of a capacity of 25 participants. The cash balance indicates amounts before depreciation and tax payment every year. Retained earning or accumulated loss is not calculated in this estimation.

After year 6, constant profitability is expected to continue and the retained earnings will become a fund for renewal of facilities and additional activity such as conventions for inter-modal transportation.

17.1.12. Possible area of participation by Japanese Cooperation Program

Japanese government will be able to cooperate in this program through the following:

- Technical assistance for initial stages of teaching including the preparation of textbooks and teaching materials such as computer software by delegating a team of experts. Teaching materials are a key component for the quality of education and the experts who produced these materials are expected to use these materials and conduct classes so that necessary amendments and improvements will be made.
- For the production of teaching materials, it might be efficient to form an independent project to contract out to a company who can organize experienced staff for compiling both academic and practical documentation and software designs.
- Teaching material should be so designed that the graduates will be able to use these materials in the actual practice and teach co-workers to comply with rules and regulations of international maritime conventions.
- Donation of teaching facilities including computers, software and other materials and equipment. Computer Based Training System (CBTS) for scheduling and cargo handling practice should be utilized for maximum effect.
- Marketing support of the graduates: It is encouraged for Japanese shipping companies to employ graduates of this education center. Participants under the employee's funding support will be assumed to go back to their companies, but

non-sponsored participants are expected to look for a place to work. There are companies who delegated managers as lecturers will be considered as potential employers in the future.

- Other facilities such as classrooms and administration equipment can be items of support, but these items are expected to be handled by the budget of ETA and DGSC.

Table 17.1.11 Financial Estimate of Operation and Initial Cost Calculation

1. Staffing Schedule

		Preparation stage		stage-1		stage-2		stage-3	
		year(-2)	year(-1)	year 1	year 2	year 3	year 4	year 5	year 6
Number of staff		2	6	11	11	25	25	32	32
Full-time Professor		0	2	2	2	4	4	5	5
Visiting Lecturer		0	0	3	3	10	10	13	13
Administration staff A		1	1	2	2	5	5	6	6
Administration staff B		1	3	4	4	6	6	8	8
Number of classes	Participants /class			1	1	3	3	4	4
Size of capacity of participants	25			25	25	75	75	100	100
Number of participants	20			20	20	60	60	80	80

2. Financial Plan of Operation

		year(-2)	year(-1)	year 1	year 2	year 3	year 4	year 5	year 6
Direct cost of administration	Sub-Total (mil Rp)	8	24	37	37	74	74	92	92
Water & Electricity	0.2milRp/pax	0	4	8	8	16	16	20	20
Telephone	1.0milRp/faculty	6	12	17	17	26	26	30	30
Publications & Printing	0.3milRp/pax	2	8	8	8	20	20	26	26
Maintenance cost of facilities	0.2milRp/pax	0	0	4	4	12	12	16	16
Salary and wages	Sub-Total (mil Rp)	77	301	389	389	785	785	985	985
Full-time Professor	84milRp/faculty	0	168	168	168	336	336	420	420
Visiting Lecturer	3.6milRp/lecturer	0	0	11	11	36	36	47	47
Administration staff A	49milRp/staff	49	49	98	98	245	245	294	294
Administration staff B	28milRp/staff	28	84	112	112	168	168	224	224
Tax payment for salary & wages	Sub-Total (mil Rp)	1	11	12	12	26	26	32	32
Professor	4.65milRp/faculty	0	9	9	9	19	19	23	23
Administration staff A	1.20milRp/staff	1	1	2	2	6	6	7	7
Administration staff B	0.15milRp/staff	0	0	1	1	1	1	1	1
Operation Expense Total	(mil Rp)	86	336	438	438	885	885	1,108	1,108
Revenue by Tuition + Fee									
Standard estimate	8.0milRp/smstr	0	0	320	320	960	960	1,280	1,280
Balance (standard case)		-86	-336	-118	-118	76	76	172	172
Balance (high expectation case)		-86	-336	-38	-38	316	316	492	492

3. Estimate of Initial Investment

Land & Building	Total	year(-2)	year(-1)	year 1	year 2	year 3	year 4	year 5	year 6
6 classrooms + office space	4,000 milRp		4,000						
Auditorium for 300 people	2,500 milRp			2,500					
Laboratory + Library	2,300 milRp		1,500	500			300		
Total Estimated cost	8,800 milRp		5,500	3,000	0	0	300	0	0
Number of Machines in operation									
Computers for Participants		0	0	20	20	20	20	20	20
Computers : Prof & Admin		2	6	8	8	15	15	19	19
New computers to be invested		2	4	22	0	7	0	4	0
Renewal of computers							2	4	22
Total number of new computers		2	4	22	0	7	2	8	22
Investment on computers	10 milRp/terminal	20	40	220	0	70	20	80	220
Audio and other teaching machinery			100		50		50		
Total amount of initial investment		20	5640	3220	50	70	370	80	220
Cash Balance (single year Standard Case)		-106	-5,976	-3,338	-168	6	-295	92	-48

4. Production of Teaching Material Assuming expatriates to work as a separate project

High-ranked manager	220 milRp/month	3 month	1 pax	660 mil. Rp
Expert instructor	180 milRp/month	5 month	2 pax	1,800 mil. Rp
Program engineer	160 milRp/month	6 month	2 pax	1,920 mil. Rp
Travel and meeting expense	85 milRp/trip	2trip/px	5 pax	850 mil. Rp
Others (contingency)	200 milRp			200 mil. Rp
Total				**5,430 mil. Rp**
(for reference)	Exchange rate as	72	Rp/yen	**75 mil yen**

17.2. Upgrading of Maritime Transport Administration

17.2.1. Maritime Administration Database Center

Regulation and its enforcement as well policy setting and investment are the primary tools used by the government to guide and help the maritime transport industry. To be able to regulate, enforce and plan for beneficial policies and investment effectively, the knowledge of conditions ands operations of the maritime transport industry is vital. However, at the current state the level of information of DGSC, the primary governing body, is very poor. This section reviews the current state of information in DGSC and Indonesia as a whole, and proposes an information system that could remedy this problem.

(1) Review of Relevant Databases for Maritime Administration

The Table 17.2.1 summarizes the relevant maritime databases in Indonesia both inside and outside DGSC.

(2) Key Problems in Information Management

Several problems are observed in terms of information management in DGSC. The following lists and describes each one.

Problem 1: Data is scattered in many agencies. Databases are kept in various agencies, thus it is very cumbersome to collect data and information. Even if the data is physically located in the same building, if the persons or agencies are different, it is very difficult to synergize data usage. For example, LK3 reports are kept at local port offices thus it is very prohibitive for DGSC headquarters located in Jakarta to consult such databases.

Problem 2: Accuracy of data is suspect. In the course of database development for STRAMINDO, there are a number of incidences wherein data entries are erroneous and data is missing. There are a number of probable reasons, such misunderstanding of the report forms and lack of effort in the part of the reporters to ensure correct data entries. Such erroneous reporting is nearly impossible to detect and correct under the current database system. This problem is particularly evident in Voyage Reports.

Problem 3: Compliance of reporting is poor. Some reports are religiously submitted in good order, but some are reports having very poor track record in terms of report compliance. The Voyage Report in particular has this problem. Despite the threat of suspension of licenses, many shipping operators continue to ignore submitting Voyage Reports. The difficulty in completing reports and the effort needed to come to the DGSC headquarters to submit reports are the primary factors blamed for the low compliance rate.

Problem 4: Data entries in different data sources are not easily linked and compatibility is suspect. If databases are linked and can be cross tabulated, the usage and utility of databases will be greatly enhanced. Currently, databases linkages are made through either vessel name or company name. Unfortunately such linkages are prone to error such as misspellings making cross tabulation by computers very difficult. The

current electronic database at the Sea Traffic and Transport could not cross tabulate because vessel names are very often misspelled.

Table 17.2.1 Inventory of Relevant Maritime Databases

Name	Data Provider	Data Keeper	Contents	Reporting Period	Method of Storage	Reg. Basis	Remarks
Voyage Report	Shipping Co.	Sea Traffic and Transport DGSC	Voyage particulars	Annually (summary) and per voyage (liner) or per month (tramper)	Hardcopy and encoded manually	KM 33	Licenses can be revoked for non-submittal of VR
LK3	Shipping Co.	ADPEL	Particulars for ship calls	Monthly summary and per port call	Hardcopy and encoded manually	KM 33	Data summarized in and submitted to DGSC Central Office as SIMMOPEL Report
PPKA	Shipping company	Sea Traffic and Transport DGSC	Vessel particulars, cargo, port calls	Every 3 months	Report submitted by paper report to DGSC	KM33	Notice of foreign flag vessels operating in Indonesia
PKKA	Shipping company agent.	Sea Traffic and Transport DGSC	Vessel particular, crew & SIUPAL	Every port calls	Report submitted by paper	KM33	Notice of foreign flag vessel's agency
Certificate of Nationality		DitKAPEL – SubDit-PPKK					
BKI Data	Shipping Companies	BKI	Vessel condition	Every docking			
Cert. of Completeness	Harbor Master	Dir. Nautical, Tech & Radio	Safety equipment condition	Every month	Report submitted by paper report to DGSC		
Rakyat License	Shipping company	Governor/Mayor	Company particular	once		KM33	Controlled through VR & LK 3
Aux. Service Oper. License	Shipping company	Governor DGSC	Company particular	once		KM33	Controlled through VR & LK 3
SIUPAL	Shipping company	DGSC	Company particular	once		KM33	Controlled through VR & LK 3
SIUPSUS	Shipping company	DGSC	Company particular	once		KM33	Controlled through VR & LK 3
IPC Report	Pelindo / Kanpel	Dir.Port& Dredging		Monthly	Report submitted by paper report to DGSC	Dir. Gen. Decree No.PP 72/7/792	Data summarized in and submitted to DGSC Central Office as SIMMOPEL Report
Perintis Data	Shipping company	Sea Traffic and Transport DGSC	Same as Voyage Report			KM33	
Maritime accident data	Harbor Master	Dir. Marine and Safety	Time & area Chronological of accident	Every accident case happened	Report submitted by fax.		DGSC officer inspect the vessel, and report to the Maritime court and shipping company

LK3 – Laporan Kedatang/Kebarangkatan Kapal (Arrival and Deparrture Report)
PPKA – Persetujuan Pengunaan Kapal Asing (Registrion for Domestic Operation of Foreign Flag Vessel)
PKKA – Pemberitahuan Keageanan Kapal Asing (Notice of Arrival of Foreign Flag Vessels for International Voyage)
SIUPAL – Surat Izin Usaha Perushaan Angkutan Laut (Registration for Shipping Company in Indonesia)
SIUPSUS – Surat Ijin Operasi Perusahaan Angkutan Laut Khusus (Registration for Special Shipping in Indonesia)
DirKAPEL - SubDitPPKK – Directorat Perkapalan dan Kepelautan – Dir. of Shipping and Seafarer – Sub Direktorat Penguk, Pendaft. & Kebangsaan Kapal (Directorate of Shipping and Seafarers – Sub-Directorate of Ship Measurement, Registration and Nationality)
BKI Data – Biro Klasifikasi Indonesia (Bureau of Classification, Indonesia)
IPC – Indonesia Port Corporation

Problem 5: Data is difficult to access and summarize. Apart from a few reports, current databases are in paper. Extracting information from archives and summarizing information will be an arduous task.

Problem 6: Lack of interest and appreciation of quality maritime database. Shipping companies are understandably more concerned about their daily operations that they consider reporting and information systems to be low priority. Poor enforcement and failure to demonstrate the utility of information systems contribute to disenchantment and lack of interest of shipping operators to information systems, and this leads to poor quantity and quality of reporting. The poor reporting leads to poor databases which would invariable lead to unsatisfactory data usage, forming a vicious cycle.

(3) Key Strategies

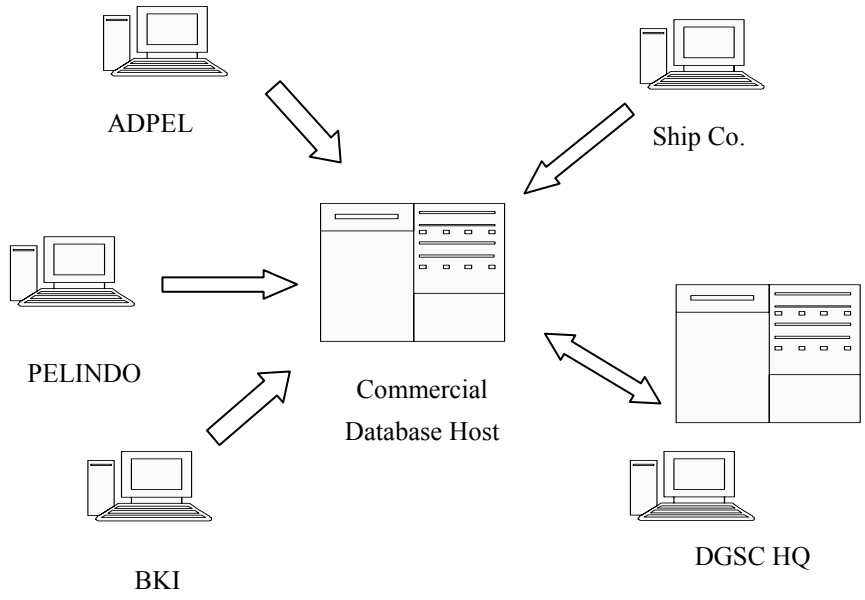
The following are proposed strategies to improve the current state of database and information system.

- Computerization and Networking (Problems 1 to 5)
- Centralized data storage (Problem 5)
- Standardization and linking of data entries (Problem 4)
- Stronger enforcement of regulations in data reporting (Problems 1, 2, and 3)
- Sampling checking of data accuracy (Problem 2)
- Increased motivation for data reporting (Problem 3)
- Increased data usage (Problem 6)
- Coordination with other agencies (Problem 1 and 6)
- Modification of Existing Regulation (as needed)

(a) Computerized, Centralized and Networked Data Flow:

One very important key to an effective information system is computerization. Computerization would lead to more efficient database management and usage. Data can be easily cross checked and processed to suit whatever needs. For maximum utility, data needs to be stored in a central database. However, since maritime operations invariable entail remote port offices, data access and sharing needs to be integrated through internet. Shipping operators also needs to be linked so as to minimize encoding works and to improve administrative services through more convenient reporting and registration services through the use of internet. Other strategic agencies should also be able to contribute and utilize data. BKI for example would be able to ensure that vessel GT is correct, thus could be used by PELINDO which charges berthage fees by unit GT. Maritime accident data would be helpful for BKI as vessels that were badly damaged needs to be reclassified. There are a multitude synergistic benefits that can be attained if databases are centralized.

Figure 17.2.1 Image of Proposed Information System



(b) Linked and Standardized Databases (Ability to cross tabulate databases):

As a prerequisite for synergistic usage of two or more databases, cross tabulation needs to be ensured. Cross tabulation requires that all records in all databases will have a common field. Currently, DGSC uses primarily vessel name. However, vessel names are prone to misspelling and are easily changed. Hull numbers are unique and unchanging and are therefore ideal for cross tabulation purposes – similar to an automobile chassis number would be for an automobile registration databases. Hull numbers should therefore be part of all databases. A photo of the vessel could also be attached to the database for visual check.

It is also important that data entries are standardized. Port names for example in current databases are variable (Semarang and Tg. Emas are used interchangeably for example). For a computerized information system, variability in the meaning of data entries would lead to system failure. Data entries in reports need to be standardized so that cross tabulation and other data processing functions would be possible. The use of codes and if data entries are entered using a specially designed software with menu selection capabilities would be able to improve standardization. Entry software, if equipped with logic checking capabilities, would also improve accuracy of data entries.

(c) Stronger Enforcement:

Enforcement of report requirements is a vital aspect of the strategy to improve the information system in Indonesia – and fortunately necessary legislation defining penalties for non-compliance are already in place. While offering incentives for reporting, there should also be appropriate punishments for non-compliance. Currently, such strict enforcement of regulations on reporting is not possible due to the difficulty of cross-checking submitted requirements of shipping operators but

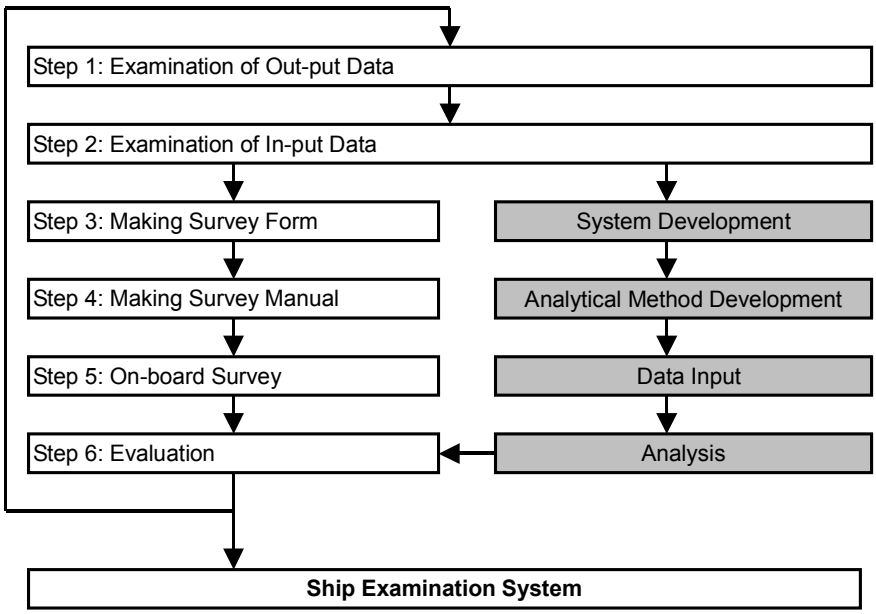
also, by the consideration that sometimes submission of all requirements is costly and time consuming.

With the computerized system, non-compliance could be easily detected and the ease of reporting through internet would no longer give shipping companies the luxury of complaining of the resources needed to submit proper reports.

(d) Sample checking of Data Accuracy

Sample checking of domestic vessels is deemed essential for understanding ship's operating performance, safe operation of ships and protection of the marine environment. Inspected data on-board can be compared with the reported data. The system can develop a useful database which may contribute to upgrading the database center. But it is not an easy task to institutionalize this system in Indonesia due to the lack of experience and shortage of experts in the field. Therefore, it is suggested to use the same form over the country with an adequate ship examination manual. Ship examination system will be improved by means of the following processes.

Figure 17.2.2 Process of Improving Ship Examination



(e) User Friendly Reporting System:

It is recommendable that once computerization is implemented, the reporting should be streamlined. For example, the LK3 and the voyage report may be combined and that the summary report for the LK3 and the Voyage Report will not be necessary. The reporting system should take advantage of the cross- tabulating features of the proposed information system. This will enhance the rationale of the information system in the eyes of the users thereby improving its acceptability and usage.

(f) Increased Data Usage and Access:

Establishing a modern information system and database system will entail a significant investment to set-up and operate. Costs must be offset by the benefits accrued and to be able to maximize the benefits, the data should be used extensively. This will also ingrain the information system in the operation of shipping companies, administrators, policy makers, investors, etc. and this will ensure that the system will be sustainable and worthwhile. For instance, performance indices and relevant statistics should be developed and published based on the database, to better inform the market and policy makers.

It is understandable that some operation data may be considered as sensitive, thus DGSC should control the access of data. However, DGSC should allow other parties to use the some of the data (especially in aggregated form) to maximize the benefit of information.

(4) Implementation Modality:

It is desirable to involve all stakeholders (DGSC, Shipping Co., PELINDO, BKI, etc.) at the onset. However, it may take some time to build a consensus on the system. It would be easier to implement the system with DGSC in control, dictating all system specifications at first and develop the system. DGSC would then demonstrate the utility of the system; especially with regards to the interest of other agencies and invite them to link with the developed system. It is much easier to entice other agencies to participate in a system that is already operational. Thus a phased implementation program may be adopted.

Phase 1: Database linkages within DGSC and Shipping Company

Phase 2: Database linkages with other agencies (PELINDO, BKI, BPS, etc)

(5) Expected Benefits:

Expected benefits from the information system are as follows:

Better informed decision making: With improved information decisions on policy setting and investment will be done at a more confident and efficient manner – both from the administrator side and the operator side. Better information would allow administrators a better appreciation of the current conditions. It would also allow administrators to detect early signs of problems and be able to maneuver at a pro-active stance rather than from a reactive stance.

Shipping operators would be better informed of the changes in the market and be able to plan their corporate strategy more effectively. Benchmarking with the industry standards would also signal shipping operators if their operations are adequate or not. This will lead to better shipping management. Performance indicators are also a key signal to investors. A better informed investment market will tend not to over invest. Better information will therefore prevent over tonnage, which is especially relevant to the market oriented shipping industry of Indonesia.

Future projection is a sensitive input in fleet and infrastructure planning. The Study has developed original database by compiling various DGSC data and the results of field surveys as well as future shipping movement in terms of O-D pairs in association with JICA/STRADA – a database building and transport planning software. Those output and software have already been transferred to DGSC. The proposed system ensures continuous works to meet future planning needs and a follow-up of the STRAMINDO plans.

Better checking system for compliance of vessels to regulations: With a fool-proof information system, administrators would have more flexibility in designing regulations. For example liner route protection against tramper services will be easily achieved if regulators have a way to easily check every vessel's activities. The information system will also enhance existing enforcements measures. Vessels with lacking requirements would easily be detected and apprehended.

The Degree of the Minister of Communications No. KM 33/2001 prescribes that DGSC conducts IMRK (Coordination of Freight and Ship Space) every half year in terms of liner route and commodity. With the proposed system, a systematic approach is possible in line with upgrading both databases, i.e., fleet and freight.

Improved public service, through improved reporting and license application procedures: The system will be very convenient for shipping operators as they need not go to DGSC headquarters or ADPEL offices to submit reports and registrations.

Minimizing illegal activities such as forging of documents and corruption: A computerized system will be able to easily detect fake documents and minimize corruption by limiting personal interaction between shipping companies and regulators.

(6) Specification for Phase 1:

The following details the specification of the proposed information system for Phase 1 implementation.

(a) System Functionality:

- Process voyage reports
- Process LK3
- Process PPKA
- Process PKKA
- Process Certificate of Completeness
- Process Rakyat License
- Process Auxillary Service Licenses
- Process SIUPAL
- Process SIUPSUS
- Process Indonesian Flag Registry
- Process Perintis Data

- Process Accident Data
- Data error and/or inconsistency alert mechanisms
- Query and cross-referencing capabilities
- Alert and alarm capabilities – alert authorities of vessels and/or companies in breach of government regulations
- Summarizing and report reproduction capabilities

(b) Software Requirements:

- Secure Web-based entry system
- Data storage system
- Data extraction and query system

(c) Hardware Requirements:

- Computer systems for all ADPEL offices with internet connection or with dedicated connection to DGSC HQ – about 300 terminals
- Data server in DGSC and Remote Host – 2 set
- Computer systems for data entry and extraction in DGSC HQ – about 15 terminals
- Internet connection

(d) Human Resource Requirements:

- Training for system operators for all ADPEL offices and DGSC HQ - 320 operators
- Training and maintenance of technical support team – 1 team

(e) Back-up and Support Requirements:

- Standardization of report forms
- Back-up system and protocol in case of system breakdown
- Hard copy reporting protocol in case electronic reporting protocols are not practical

(f) Checking and auditing protocols – Shipping Performance

The information system will be able to provide the necessary performance indicators, but it is still necessary to perform on-board inspection to verify and enhance the information system and administration in general. Shipping performance audit will provide details to macroscopic fleet productivity measures. It will cover fuel usage, ship store usage, routing system etc. It will also allow administrators a chance to randomly check shipping operators if they are accurately reporting their activities. On-board inspections will also provide the opportunity to check the conditions of the vessels apart from the regular safety checks being conducted by Harbor Masters.

(7) Estimated Cost for Phase 1:

Based on the proposed specification of the information system for Phase 1 implementation, the cost to set-up and operate the system are as follows:

Table 17.2.2 Cost Estimate for Set-up and Operation for Information System

Item	Quantity	Unit cost (mill. Rp)	Cost (mill. Rp)	Remarks
Initial System Set-up			**4,382**	
Computers	315 units	8.5/unit	2,677	1 for each ADPEL office (300 units) and 15 units in DGSC HQ
Server	2 unit	100/unit	200	
Operators training	320 pax	1.5/pax	480	
Technical team training	5 pax	30/pax	150	
Software	3 set	25/set	75	
Consultancy	1 set	800/set	800	For clarifying system functionality
Annual Operational Cost			**2,553**	
Regular Computer Replacement	315 units	2.8/unit	882	Replacement every 3 years
Regular Server Replacement	2 units	20/unit	40	Replacement every 5 years
Software upgrade	3 set	5/set	15	Upgrade every 5 years
Human resource upgrade	1 set	50/set	50	
Internet Connection	315 units	3.6/unit	1,134	
System administrator	2 pax	180/pax	360	
Database hosting	1 unit	72/unit	72	

(8) Funding for Phase 1

It is proposed that the system set-up be financed through grants or thorough public funds. The operation cost is however, proposed to be financially self-sustaining. Currently there are about 400 million accumulated GT in 500,000 domestic ship calls. If DGSC is able to additionally collect only 7 Rp per GT per call for modernized information services, the cost of operating the entire system would be easily recovered. This revenue should be accrued to a special fund – to be earmarked for upgrade and operation of the information system.

(9) Issues for Considerations:

Several issues need to be considered in the implementation of Phase 1:

Linkages with other relevant agencies (for Phase 2): To be able to ensure compatibility of systems, standards in data form and hardware and software requirements needs to be considered.

Extension to EDI services: The information system should consider the eventual evolution to EDI services including in its scope international shipping services.

17.2.2. Daily Monitoring System for Subsidized Operation

(1) Background

The government has been responsible for pioneer shipping to provide services in remote and undeveloped areas in order to support local economies; stimulate dynamic regional development; and, maintain national stability since 1974. In 2002, the government maintained 49 routes. Pioneer shipping accounted for only two percent for passenger shipping and less than one percent for freight shipping in domestic waters. Despite its marginal share, it delivers indispensable and invaluable transportation services to vast areas.

Pioneer shipping is implemented by the central government through subsidies to cover operation costs of shipping companies that are engaged in the provision of pioneer shipping services. The amount of the subsidy is determined by computing the difference between ship operating costs and income. In 2002, the government subsidized Rp 76 billion in total. The subsidy ratio (subsidy amount / total operating costs + 10% profit) was as high as 89.1%.

Besides heavy dependency on operation subsidy, current pioneer shipping has other problems, including, among others, unreliable services, unsuitable routings, inadequate ship design particularly for passengers, obsolete and limited available fleet, and little incentives to improve services and reduce subsidy. The central government is keen on improving on those weaknesses. Therefore the government directly procured a fleet of 11 pioneer ships ranging from 350 DWT to 750 DWT during the period 2002-2003 and plans to procure more. Regarding operation improvement, the government considers to introduce a tracking system which enables DGSC to monitor all pioneer ships though an especially designed telecommunication network.

In addition to pioneer shipping, many of actual domestic shipping services are less and non-commercial and, under recent environments, they are facing difficulty in continuing services including some PELNI services, some traditional shipping services and some local government initiated services. Taking account of such circumstances, the STRAMINDO Master Plan proposes to establish sustainable tertiary shipping system where less or non-commercial but socially essential shipping services are put into one common basket. Under this concept, the government's role should be enhanced by way of increasing government ownership and co-ownership of the fleet, more involvement of the local government, and improving services and rationalizing operation subsidy with a daily monitoring system. The Master Plan estimates that the tertiary shipping system will need a several times' bigger fleet than the existing pioneer shipping fleet by the year 2014.

(2) System Concept

This section aims at designing a daily monitoring system for subsidized operation.

A monitoring system is expected to support the tertiary shipping system for its efficient management and thus the system will cover all the tertiary shipping vessels in the future. As an Action Plan component, however, the system is designed to cover only 50 vessels

(almost equal to the existing pioneer shipping fleet) in order to focus on swift implementation.

The daily monitoring system project consists of the following components:

1. Hardware procurement in each ship;
2. Hardware procurement in head office;
3. Network installation (installation) of tracking system software; and,
4. Training for operators.

Ship-to-shore communication system will be installed on board to send specific vessel information to an ashore server periodically. An ashore server will collect and analyze vessel information and the processed data will be transferred to a management web site. ORBCOMM will be used as the primary telecommunication means between vessels at sea and gateway earth centers (GEC).

The system will deal with data collected either automatically or manually, and transferred to a server and finally analyzed and display in an organized manner. The flow of data processing works is explained as follows:

1. The position and other information of a ship are transmitted in the form of e-mail through ORBCOMM terminal equipment via ORBCOMM satellite and then to ORBCOMM earth station.
2. The received e-mail is identified by ship and the ship database is automatically updated in a management information service web.
3. The updated ship database is automatically analyzed and is ready to display upon request.
4. The updated displays are recorded at least within one month.

(3) Monitoring Items

The system monitors two broad aspects: ship navigation and ship maintenance. Possible monitoring items are listed as follows:

(a) Ship navigation

Position information: latitude longitude, direction, ship's speed, wind direction, wind velocity, etc., through automatic data collection.

- It is possible to understand external vessel conditions and analyze navigation risk in case of hazardous climate.

Cargo and passenger information: types and volumes of loaded cargoes and passengers on board through manual input

Engine information: fuel volume and fuel consumption through automatic data collection

Navigation schedule information: ETA and ETD through manual input

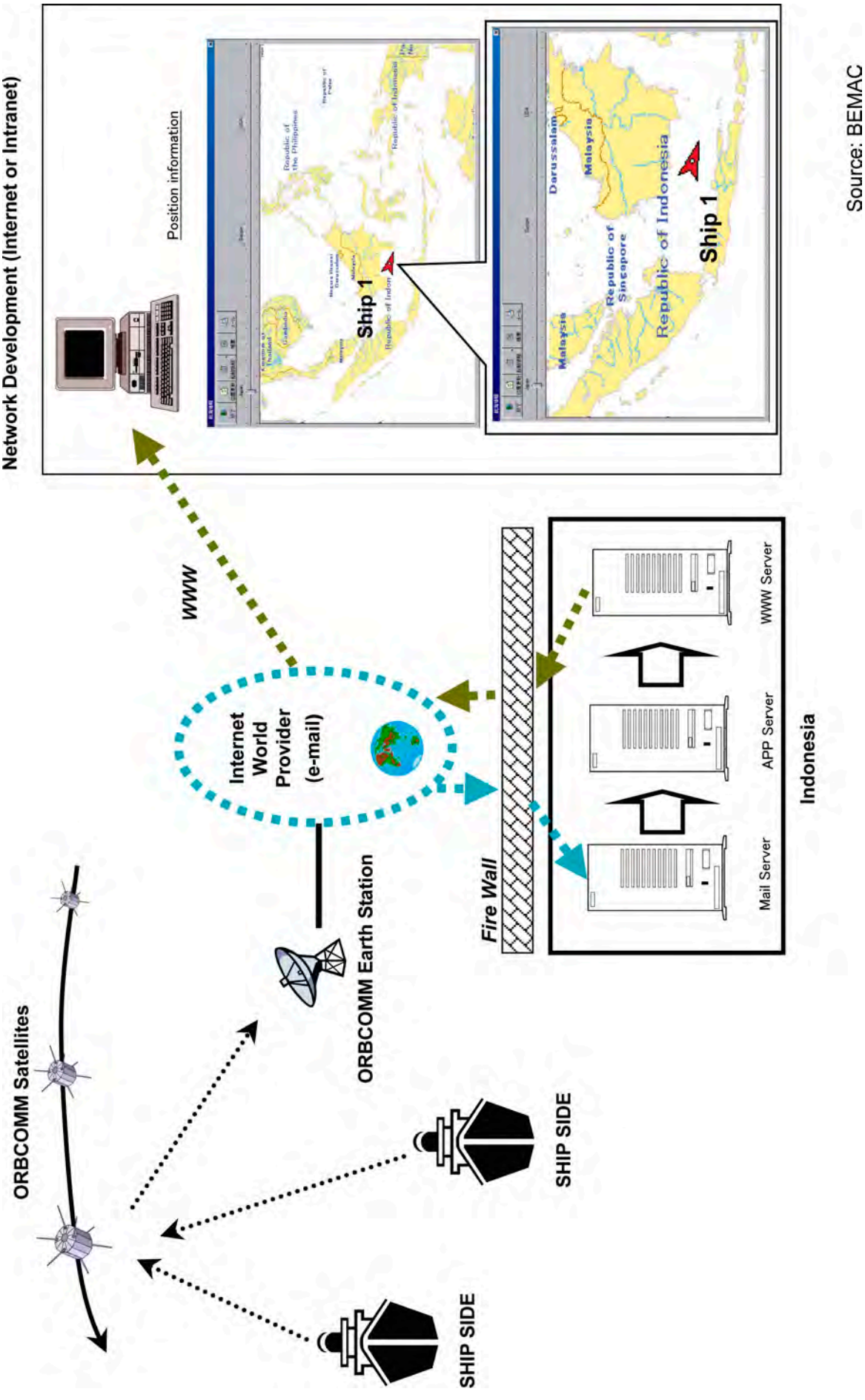
(b) Ship maintenance

Shaft horsepower meter: shaft horsepower through automatic data collection

- It is useful to judge engine conditions on land particularly associated with fuel consumption data.

Conduct of ISM-Code: The specific items on a vessel's ISM-Code through manual input

Records of abstract log on navigation and engine: vessel navigation and engine related abstract logs for secondary use through manual input



Source: BEMAC

Figure 17.2.3 System Configuration of Pioneer Shipping Monitoring System

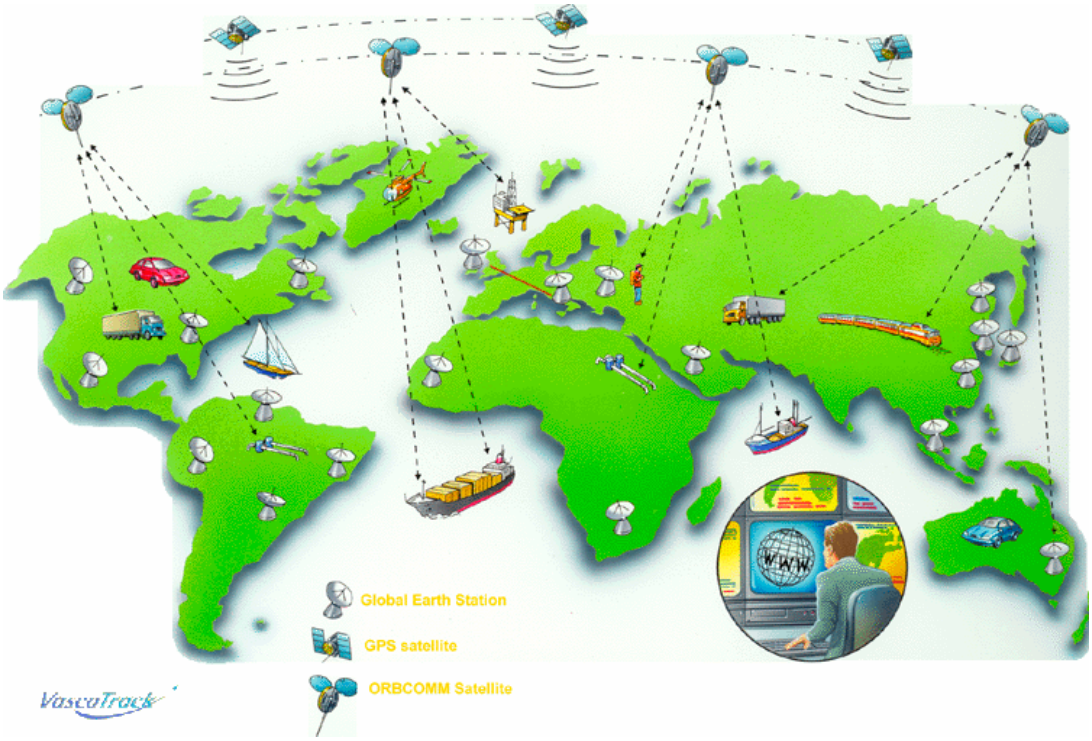
Column: ORBCOMM Services' Features

The world's first commercial global wireless data and messaging system. The ORBCOMM system uses low-Earth orbit (LEO) satellites to provide cost-effective tracking, monitoring and messaging capabilities to and from anywhere in the world. Similar to sending and receiving two-way paging or e-mail, the system is capable of sending and receiving two-way alphanumeric packets of data. These short, economical messages increase the efficiency of remote operations by making critical information readily available, often from areas beyond the geographic and economic reach of traditional systems.

The advantages are listed as follows:

- Global coverage via 32 satellites
- No international roaming charges
- Designed for tracking applications
- Compact "intelligent" tracking beacons
- Low power consumption
- Simple antennas
- Cost effective for commercial use

The condition: Adopting ORBCOMM can be done under the approval of ORBCOMM products and services in Indonesia.



Source: Vasco Track

(4) System Operation Images

The following display samples are depicted for better understanding of the monitoring system:

i) **Approval Display**: For security reason, an officer who accesses this monitoring system is required to input his ID and password.

ii) **Display of All Monitoring Vessels**: This display shows all positions of monitoring vessels on chart and the exact position data at the latest reported time. “Click” on ship name on the chart and the screen changes into a vessel-wise display.

iii) **Display of Vessel Information**: This display shows exact vessel location on an enlarged chart. The numerical data includes vessel tracks, sailing speed, fuel consumption, cargo/passenger on board. To know more detail, “Click” on a relevant column from “tracking”, “fuel” and “cargo/pax” and the screen jumps into a selected display.

iv) **Display of Vessel Tracking**: This display shows a vessel’s sequential positions within recent 24 hours in the form of tracking chart.

v) **Display of Fuel Consumption**: Two displays are available to observe fuel consumption by vessel, i.e., one for tabulation and the other for its graphical illustration. Both displays show daily fuel consumption for the last week or the last month.

vi) **Display of Loaded Cargo and Embarked Passengers**: Like fuel consumption, two displays are available to observe loaded cargo and embarked passengers during the last week or the last month.

vii) **Display of Vessel Maintenance**: The upper display shows recent repair and maintenance records. Each works must be recorded and inputted into the system.

Figure 17.2.4 Display Images of Pioneer Shipping Monitoring System (1/2)

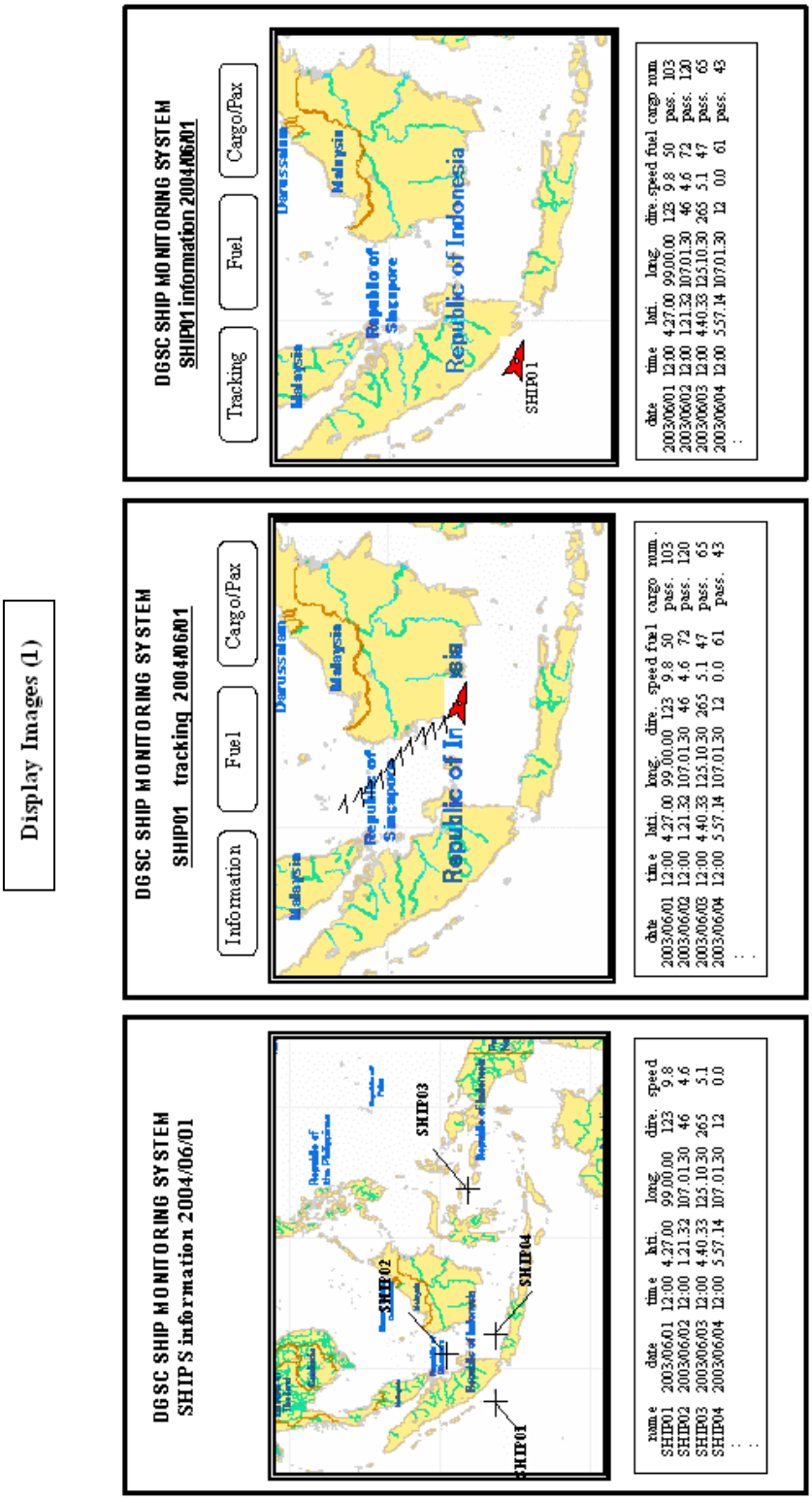
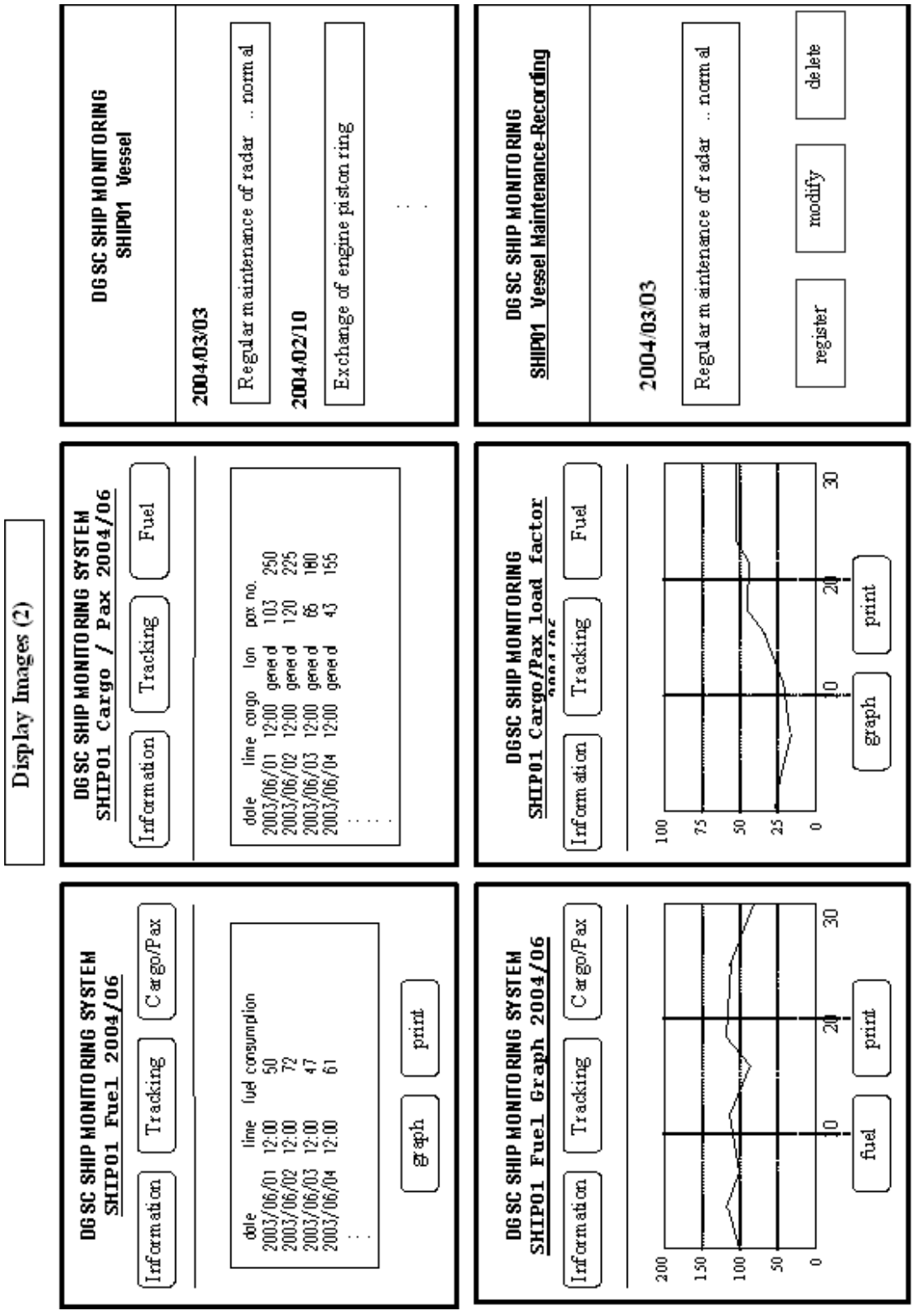


Figure 17.2.5 Display Images of Pioneer Shipping Monitoring System (2/2)



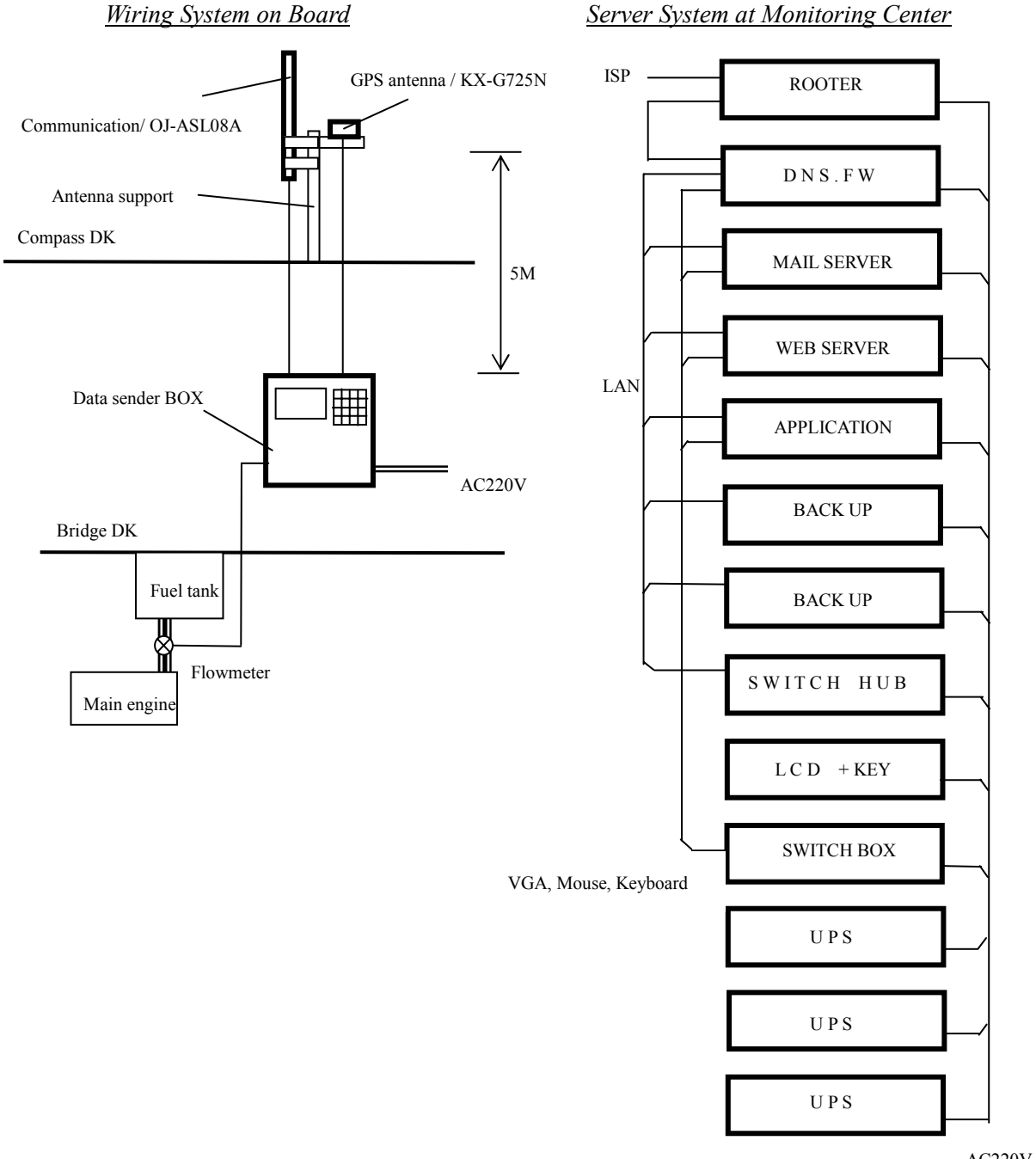
Source: BEMAC

(5) Equipment Installation Plan

Major equipments necessary on board are antenna and communication terminal (data sender box). Both equipments will be fixed on adequate locations, i.e., antenna on compass deck and communication terminal on bridge deck. A power source of DC 24/5V must be provided. Fuel and engine data will be transmitted to a communication terminal in pulse signal. Data to be input manually will be done on a data sender box.

A Ship Monitoring Center of this system will be located at DGSC, Ministry of Communications, Jakarta. Major equipments are Email Server, Web Server, Application Server and DNS/Fire Wall Server.

Figure 17.2.6 Equipment Installation of Monitoring System



(6) Cost Estimate

Based on the proposed specification of the monitoring system, the initial cost to set-up the system is estimated at Rp 17,250 million. Among the equipment items, communication terminals and the software inside the server system will be developed on a made-to-order basis. 50 sets of communication terminals will be manufactured.

The operation costs of the proposed system consist of communication expenses and maintenance charge. Under the current telecommunication development trend, satellite and internet based communication costs have been reduced significantly. For example, the ORBCOMM airtime charge is less than US 0.5 cent per byte in 2003. Provided that one-time communication cost is Rp 5,000 and two ship monitoring reports are required per day or every 12 hours, the annual communication cost is estimated at Rp 183 million. Maintenance cost is deemed adequate at 1% of the equipment costs or Rp 150 million.

Table 17.2.3 Cost Estimate for Setting Ship Monitoring System

Location	Item	Unit Cost (Rp Mil.)	Cost (Rp. Mil.)
Ship	Antenna & Communication Terminal	135	6,750
	Fuel & Engine Meters	15	750
Control Center	Server System including Software	Lump-sum	7,500
Both	Training and System Installation	Lump-sum	2,250
Total			**17,250**

(7) Some Considerations for Effective Implementation

This monitoring system provides large incentives to DGSC, e.g., accurate monitoring of services, better coordination among subsidized vessels and reduction in operation subsidy, while on the other hand will provide little incentive for shipping operators as long as the present subsidy system remains the same. Therefore, DGSC will need to own the monitoring equipments (hardware) in each ship and install them through their own volition and responsibility. In this relation, contracted shipping companies are obliged to maintain the monitoring equipment and provide some manually collected data such as cargo, passenger and ship maintenance and repair records.

It is proposed to introduce this monitoring system through grants or the current pioneer shipping subsidy fund.

If its benefit to DGSC, mainly reduction in operation subsidy, would be surely larger than the cost of the existing system and its annual operation (Rp 17.6 billion in total), the monitoring system should be developed as soon as possible within the current pioneer shipping subsidy fund. For reference, the first year's expense (Rp 17.6 billion) accounts for 19.9% of the operation subsidy in 2003 (Rp 88.5 billion).

In the case of requiring grant aid from a donor country, DGSC needs to address the importance of such subsidized shipping services under the context of national development through mitigating regional disparity. Anticipated impact of the ship monitoring system also needs to be demonstrated.

Chapter 18

CONCLUSIONS AND RECOMMENDATIONS

18. CONCLUSIONS AND RECOMMENDATIONS

18.1. Conclusions

Domestic shipping in Indonesia is not new. The industry as well as the government has endeavored to fulfill its mission in providing reliable and competitive maritime transport services as the prime artery of life and integration of the archipelago. However until today this mission has not been satisfactorily achieved. In other words, the domestic shipping sector has a great development potential. There would be a growing demand for transport which can be economically and effectively handled by domestic shipping as its service coverage and density are expanded and reliable and stable services are provided. The economic benefits of domestic shipping development are significant as indicated by the estimated EIRR of 39% covering directly measurable benefits alone. Indirect benefits may extend to the associated development of maritime related industries, promotion of socioeconomic development beyond Java and reduction in regional disparity accordingly, and stimulation of related industry development.

While Indonesia supposedly holds cabotage right in shipping, in practice, the industry depends on foreign chartered vessels substantially.

The Study's observation reveals that many vessels, particularly conventional vessels, are likely to anchor due to overly extended cargo waiting. Over-capacity sometimes triggers unhealthy dumping freight rates. In reality, there are plenty of vessels but the vessels which can provide satisfactory services are insufficient in the market.

The estimated productivity of the dry cargo fleet is low at only 7,649 ton-miles per DWT or only 37% of the Japanese case. Therefore, there must be a complicated situation where high dependency on foreign chartered vessels and over-capacity of the domestic fleet concurrently exist.

In this connection, the Study has found a vicious circle as a result of unfavorable shipping investment environments in Indonesia. Many shipping companies have indicated their intention in procuring additional vessels. However, shipping companies find it difficult to arrange for ship loans in the domestic financial markets. On the other hand, ship loans could be more easily arranged through foreign sources. Some large shipping companies tend to procure vessels abroad as flagged-out vessels. Such arrangements are beyond the capacity of small-to-medium companies and they will have no other alternative but to invest in low cost but old and scrappy vessels. The net effect is a continually increasing dependency on foreign chartered vessels and lowering fleet productivity.

There is a strong need for the domestic shipping industry to depart from the vicious cycle and to shift to a new paradigm of developing a competitive national fleet where national shipping lines can access adequate financial sources to procure competitive vessels as shippers require, enjoy stable business profits and avoid degrading of vessel asset in the medium to long-term, and be able to re-invest in a more competitive fleet. For this purpose, shipping companies have to make efforts to modernize their business and the government needs to foster a favorable shipping investment environment, install a strategic public finance scheme to some important fleet development areas, and provide adequate shipping related infrastructure and facilities such as ports and shipyards.

The Study has confirmed that the domestic shipping industry will be able to modernize and expand its fleet from the present situation of 7.0 million DWT/GT of 23 years old on the average to a larger and younger fleet of 14.4 million DWT/GT of 14 years old on the average in 2024 provided that vessel depreciation costs and an adequate profit, say 5% of business turnover, can be used. As long as such investment can be changed to national tonnage, it is possible for government to enforce full cabotage regime by the year 2024. A share of national tonnage in an intermediate year of prior to 2024 is estimated at 86% which is achieved when selected seven commodities, i.e., coal, oil, CPO, fertilizer, rice, rubber and wood, is mandated to be transported by the national fleet only while present haulage patterns of non-selected commodities remain.

While Indonesian domestic shipping is indispensable and there is a large development potential, there are a number of conditions to be met to realize the expected effects of domestic shipping development. They include, among others, the following:

(1) National Shipping Policy and Strategic Development Plan on Sea Communication

It is understood that shipping policy is determined between government and the shipping industry, at best, including shipping related industries. Although only sea transportation can promote economic development over the country, such dynamic linkage is ignored. As a first step to advocate a national shipping policy that is formulated and implemented for the benefit of all, it would be necessary to involve shippers and cargo owners. It is desirable for the Ministry of Communications to draft a comprehensive domestic shipping development framework based on the Study's output and proposals and incorporate it into the national development policy. In line with this, it is also important to prepare the next "Strategic Development Plan on Sea Communication 2005-09" including the Action Plan components proposed in the Study.

(2) Improvement of Shipping Investment Environments

Ship-owners require sources of funds which guarantee a sufficient term of repayment with a low interest rate to be able to modernize its operations. To realize this, the business environment of domestic shipping needs to be improved. The advent of free trade regime in the region will create more challenge and potential to domestic shipping as domestic and international shipping systems will become competitive as well as supplementary. Therefore, Indonesia needs to develop an advantageous or at least a comparable investment environment relative to its neighboring countries by way of good coordination of private and public financing schemes.

(3) Modernization of Shipping Business Management

Most of Indonesian shipping companies are small entities operating one or two vessels. To enhance business competitiveness, their activities should be rationalized through mergers and acquisitions, concentration on specialized services, and contract-out of ship management services. To introduce such rational measures, human resource development, specifically training of management staff is top priority.

(4) Development of Shipping Supporting Infrastructure and Facilities

Infrastructure development, covering ports, waterways and aids to navigation, etc, need to be adequately developed to meet the specific requirements of domestic shipping as planned in the Study. Shipbuilding, repairing, and breaking should be firmly supported so

that the domestic shipping fleet could be expanded, modernized, and maintained at an adequate level. In practice, shipping development is a matter of achieving synergy between shipping and supporting infrastructure and facilities.

(5) Enhancement of Ship Safety and Preservation of Marine Environment

It is one of the serious concerns why Indonesia needs to improve its domestic shipping system. All aspects of shipping activities should pay due consideration to safety and the environment from a viewpoint of IMO-centered regime particularly contemporary issues such as ISM-code, ISPS, preventive measures of oil spill accidents and piracy and armed robbery incidents.

(6) Establishment of a New Partnership between Public and Private Sectors

The drastic deregulation policy in the late 1980s made the relation between the administration and the industry loose. However, one key item to realize a favorable domestic shipping system as proposed in the Master Plan is to establish a new partnership between public and private sectors because their coordinated efforts are necessary. The maritime transport administration should take a more leading role in monitoring shipping activities, identifying problems and issues, and guiding desirable development directions with adequate governmental interventions.

18.2. Recommendations

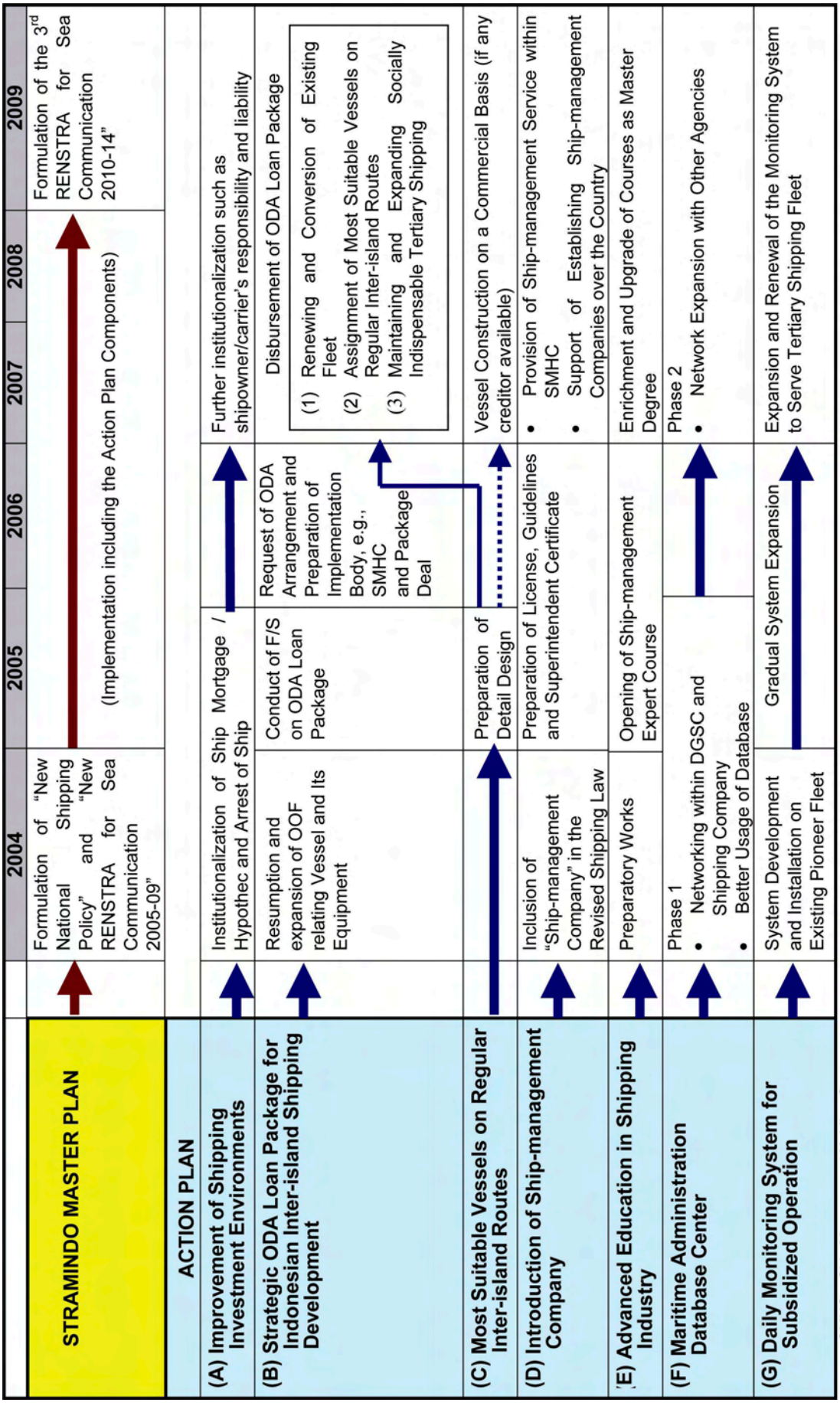
As a first step of realizing the Master Plan, until the year 2009, efforts must be concerted on securing necessary investment amount (Rp 27.6 trillion) for fleet investment from excellent sources, as well as, enhancing fleet competitiveness and avoiding fleet asset devaluation. Although capacity building is a rather longer subject, the programs urgently required and strategically important should be initiated immediately. Figure 18.2.1 details the implementation schedule of the proposed Action Plan.

It is recommended that seven specific components of the Action Plan be implemented at the earliest possible time. They are:

a. Urgent policy package of improving shipping investment environments
b. Strategic ODA loan package for Indonesia inter-island shipping development
c. Building and assignment of the most suitable vessels on regular inter-island routes
d. Introduction of ship-management company
e. Advanced education in shipping industry
f. Maritime administration database center
g. Daily monitoring system for subsidized operation

It is also recommended that post-evaluation of the Master Plan be done every five years using standard performance indicators such as domestic fleet productivity (ton-mile per DWT), share of Indonesian flagged vessels in transporting domestic cargo, and containerization rate.

Figure 18.2.1 Detailed Implementation Schedule for the Action Plan



18.3. Considerations for Effective Implementation

Most of shipping activities are profit making. Therefore, rationalization and mobilization of market mechanism is of great importance. In the case of Indonesian domestic shipping, however, the study has identified essential government intervention areas as proposed in the Action Plan. Those measures, when implemented properly, will be vital to modernize the domestic shipping system, to restructure the domestic shipping industry, and to reform the maritime transport administration in implementing the Action Plan. There is considerable international experience in making such reforms and so the government should consider requesting ODA schemes in developing and implementing the Action Plan.

Available ODA schemes to help the Action Plan implementation are described per component as follows:

(a) Urgent policy package of improving shipping investment environments

The policy package includes several elements. Each element needs institutional arrangement such as enactment and revision of domestic legal framework and accession to relevant international convention. International organizations such as IMO and UNCTAD may give policy advice on them. In addition, expatriate policy advisor would be a potent resource if internally available such as a JICA expert.

(b) Strategic ODA loan package for Indonesian inter-island shipping development

After graduation of the IMF fiscal control in December 2003, government may resume and widely receive OOF schemes such as export credit on vessels. Regarding ODA fund, there is a technical requirement to conduct F/S on the proposed loan package consisting of (i) renewing existing fleet, (ii) construction of liner vessels, and (iii) development of tertiary shipping system. Provided that the proposed package is feasible, government may request ODA fund with preparing a Ship Management and Holding Company (SMHC) as proposed in the Action Plan. For this package, either MOF or an inter-agency body could be responsible for implementation.

(c) Building and assignment of the most suitable vessels on regular inter-island routes

This loan package will be implemented either within or outside the ODA loan package. Under the umbrella of the ODA loan package, new vessels will be built through a package deal method where foreign and local shipyards work together. Local shipyards generally lack experience and therefore expatriate experts are helpful such as senior volunteers (SV) dispatched by JICA.

(d) Introduction of ship-management company

This is a new and, in this sense, difficult concept to take root in domestic shipping. DGSC intends to add ship-management company in the revised Shipping Law NO.21/1992 as one of shipping auxiliary services. With recognition of its possible role to modernize both shipping and ship repairing services, the study suggests DGSC to harness the skill and coverage associated with regulatory conditions such as ship-management company license and guidelines, and superintendent certificate.

In this connection, a SMHC's management function covers ship-management services. Thus, effectiveness of ship-management can be demonstrated under the ODA loan package.

(e) Advanced education in shipping industry

Before opening an advance education program by ETA, it will take one or two years for necessary preparation. The program will start from expert courses such as ship-management to enriched syllabi such as master degree course of shipping management. Some expatriate lecturers are prerequisite to operate such an advanced education program. Although the program management is self-financing in principle, collected tuition fees may not cover expatriate's costs. The implementation body may request ODA schemes such as dispatch of expatriate lecturers and production of teaching materials.

(f) Maritime administration database center

Many data exist in DGSC and many others are submitted to DGSC day by day. In fact, DGSC is a database center although computation, reporting and analyses are insufficient. It is an internal issue to be solved even without ODA. But ODA arrangement may be an effective way to develop a comprehensive database center with generating more benefits within a limited time. ODA arrangement may cover hardware and expatriate's advise on reliable database building and usage of database for planning and decision-making.

(g) Daily monitoring system for subsidized operation

Due to technology advancement and cost reduction in satellite communication and internet, such systems have become reasonably practical nowadays. DGSC, in charge of subsidized pioneer shipping operation, is eager in introducing the daily monitoring system to curb a high subsidy rate of 89%. It is justifiable to request ODA arrangement since pioneer shipping is socially indispensable service for alleviating regional disparity. However, if the system could cut considerable operation subsidy, i.e., Rp 76 billion in 2002, and recover the cost in a few years and so, there is no need to wait for a long procedural ODA arrangement. Under the proposed ODA loan package, the monitoring system will have to cover all tertiary shipping fleet as a condition to receive public support.