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FINAL REPORT ON THE
10-YEAR SHIPPING PROGRAM OF
THE PHILIPPINE GOVERNMENT

NOVEMBER, 1973

OVERSEAS TECHNICAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

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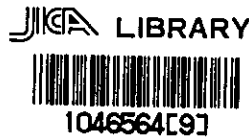
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P R E F A C E

In response to the request of the Philippine Government, the Government of Japan entrusted the Overseas Technical Cooperation Agency (OTCA) with the task of undertaking a feasibility survey for the Ten-year Shipping Program prepared by the Philippine Government.

The OTCA, fully realizing the significance of the work assigned to it, organized an advisory mission comprising eight experts headed by Mr. Hiroyuki Nakato and dispatched it to the Philippines from January 30 to March 3, 1973.

During this period the mission made an investigation as well as studied and discussed with the officials of the Philippine Government various problems concerning the program.

After the mission's return to Japan, the results of investigation were analyzed and the final report is herewith submitted to the Philippine Government.

It is my sincere hope that this report, which is an outcome of the co-operation of the peoples of the Philippines and Japan, will prove to be useful in some way for the future development of the Philippines.

On behalf of the OTCA, I would like to take this opportunity to express our deepest appreciation to the Philippine Government, for its unlimited co-operation and assistance and the warm hospitality extended to the mission during its stay in the Philippines.

Keiichi Tatsuke

Director General,

OVERSEAS TECHNICAL COOPERATION AGENCY

Members of the Advisory Mission

<u>Name</u>	<u>Responsibilities</u>	<u>Affiliation</u>
Hiroyuki Nakato	Chief of the mission	Ministry of Transport
Masayuki Tanaka	Ship machinery	ditto
Norio Miyake	Shipbuilding policy	ditto
Takashi Kimura	Coastal shipping	ditto
Hiroshi Endoh	Ocean shipping	ditto
Kohichi Satoh	Finance	Japan Development Bank
Mitsuo Ozawa	Shipbuilding facilities	Kawasaki Heavy Industries
Mitsuo Iwasa	Liaison	Overseas Technical Cooperation Agency

Term of the Survey Tour: January 30 - March 3, 1973 (33 days)

Course of the Survey Tour: As shown in the map on page 6.

Itinerary

- JAN. 30 (Tue) Departed Tokyo at 12:25 (Flight No. KLM 862).
Arrived at Manila at 15:30.
- 31 (Wed) Visited the Japanese Embassy in Manila and the Manila
Office of JETRO.
- FEB. 1 (Thu) Visited the Board of Investments (BOI).
- 2 (Fri) Attended an Inter-Agency Meeting conducted by BOI.
Visited the Philippine Coast Guard Headquarters and
the Development Bank of the Philippines (DBP).
- 3 (Sat) Visited El Varadero de Manila, the Philippine President
Lines (PPL), and the Manila Branch of the Bank of Tokyo.
- 4 (Sun) Holiday.
- 5 (Mon) Visited the Bataan National Shipyard (BNS) of NASSCO
and the Engineer Island Shops (EIS).
- 6 (Tue) Visited the National Economic Council (NEC).
Inspected the 1200 G/T cargo ship, PUZON II.
Visited the Filipino Shipowners' Association.
- 7 (Wed) Visited the shipyard in Navotas, the Board of Trans-
portation (BOT), and the United Philippine Lines (UPL).
- 8 (Thu) Visited the shipyards in Manila, the Presidential
Economic Staff (PES), the Central Bank, the Asian
Development Bank (ADB), and the Compania Maritima.
- 9 (Fri) Visited the Cavite Naval Base, the Escaño Lines, the
National Investment & Development Corp. (NIDC),
and the Private Development Corporation of the
Philippines (PDCP).
- 10 (Sat) Left Manila at 11:30 (Flight No. PAL 111) and arrived
at Cagayan de Oro at 13:10.
Inspected the Del Monte Canning Factory.
Visited the Philippine Iron Construction & Marine Works
(PICMAW).
- 11 (Sun) Left Cagayan de Oro at 13:20 and arrived at Iligan at
16:00 (by car).
- 12 (Mon) Visited the Iligan Integrated Steel Mills, Inc. (IISMI).
Inspected the Port of Iligan and its facilities.
Visited Maria Cristina.
- 13 (Tue) Left Iligan at 8:20 (Flight No. UM 724) and arrived
at Cebu at 9:05.
Visited the Cebu Shipyard & Engineering Works, Inc.
Inspected the port of Cebu and its facilities.

FEB. 14 (Wed) Visited the shipyards and shipping companies in the vicinity of Cebu and the Conference of Inter-Island Shipowners & Operators (CISO).

15 (Thu) Left Cebu at 13:20 (Flight No. PAL 459) and arrived at Davao at 14:40.

16 (Fri) Inspected the Port of Davao and its facilities. Visited the Davao Municipal Office.

17 (Sat) Visited the Royal Wood Industry.

18 (Sun) Left Davao at 11:05 (Flight No. PAL 497) and arrived at Zamboanga at 13:20.

19 (Mon) Inspected the Port of Zamboanga and its facilities. Visited the Zamboanga Municipal Office.

20 (Tue) Left Zamboanga at 8:45 (Flight No. PAL 172) and arrived at Iloilo at 11:00. Visited the Iloilo Dock & Engineering Co. (IDECO) and the Negros Navigation Co., Inc.

21 (Wed) Inspected the port of Iloilo and its facilities.

22 (Thu) Left Iloilo at 8:45 (Flight No. PAL 172) and arrived at Manila at 9:45.

23 (Fri) Paid a courtesy call on the Secretary of Finance and the Board of Investments (BOI).

24 (Sat) Left Manila at 6:00 and arrived at San Fernando at 17:00 (by car). Inspected the Port of San Fernando and its facilities. Left San Fernando at 17:50 and arrived at Baguio at 20:10 (by car).

25 (Sun) Left Baguio at 14:30 and arrived at Manila at 22:00 (by car).

26 (Mon) Paid courtesy call on Mr. Paterno, Chairman of BOI. Engaged in preparation of the interim report.

27 (Tue) ditto.

28 (Wed) ditto.

MAR. 1 (Thu) ditto. Held a dinner party hosted by the chief of the mission.

2 (Fri) Visited the Japanese Embassy in Manila. Submitted the interim report to Mr. Paterno, Chairman of BOI.

3 (Sat) Left Manila at 13:30 (Flight No. NW 004) and arrived at Tokyo at 17:30.

1. INTRODUCTION

At the request of the Philippine Government, the advisory mission visited Manila on January 30, 1973 to make advice and recommendations about the planning of the basic shipping and shipbuilding reconstruction program of the Philippines. The mission promptly entered into a conference with the staff of the Board of Investments. At the conference, the Philippine Government presented its Ten-Year Shipping Program and requested the mission to form a candid opinion on the program and submit a report.

In response to this request, the mission visited the pertinent government offices, banks, shipowners' associations, and shipping and shipbuilding companies, and inspected local port and harbor facilities (see "Itinerary"). As a result of these visits and inspections, the mission obtained the first-hand knowledge about the situation and the various opinions cherished among the people concerned.

The mission prepared an interim report on the ten-year program and submitted it to Mr. Paterno, Chairman of the Board of Investments, on March 2, 1973, the day before its return to Japan.

Due to the limited time available for the survey, the interim report did not cover the details of the program. For this reason, after their return to Japan the mission prepared this final report after close examination of all the data obtained during the survey tour.

2. GENERAL

2-1. Suitability of the Program Operation Period

Business undertakings such as shipping or shipbuilding require a considerable period of time before they become lucrative. Framing a reconstruction program in a long perspective is of utmost necessity. In this respect, the period of ten years appears reasonable for the operation of the program.

However, economic and social situations are changeable and it is extremely difficult to foretell the future; it is no doubt that in the next ten years the economic environment surrounding the program will widely change owing to rises in commodity prices and labor cost and changes in the international economic situations. It is desirable to take some steps after an appropriate lapse of time - about five years, for instance - to review the progress, the effect, and the expenses of the program and to reframe the entire program if necessary.

2-2. Scope of the Program

A shipyard equipped with adequate facilities could turn out at least 4 ships annually, if fully operated.*

With proper facilities, the construction of no less than 56 ships in ten years is not an undreamed of thing.

As for replacement of overage ships with new ones, priority should be given to the shipowners who are willing to scrap them. For those who are faced with financial difficulties, financial aid should be offered through an appropriate system established for this purpose.

Judging from the mission's observations the average size of the existing ships is around 1000 G/T. Efforts should therefore be concentrated on the construction of ships of this class for the present. In due consideration of the future increase in the cargo volume and improvement of port facilities, however, it is absolutely necessary to organize plans for the construction of ships of heavier classes.

Replacement of overage ships with new cargo-passenger ships will be inevitable. It is believed, however, that the time will soon come when the Philippines requires trade-oriented cargo ships independent of passenger ones for increased efficiency.

Note: * In Japan the annual average output per shipyard reaches 6 to 8 ships.

2-3. Insufficiency of Replacement Ships to be Constructed

According to the data furnished by the Philippine Coast Guard Headquarters, there are 434 inter-island ships (390,499 gross tons)* in total of which 295 (212,041 gross tons) are over 20 years of age. These 295 ships should be promptly replaced with a view of safety and economy. But covered by the program are only 56 ships. Replacement of the remaining overage ships, however, should be carried out by using every available opportunity.

Note: * Figures as of 1971.

3. FINANCE

3-1. Financial Plan

The ten-year shipping program foresees that the estimated funds required for the construction of 56 inter-island ships will amount to 560 million pesos, and expects 112 million pesos (20% of the total amount) in funds from the ship-owners, 328 million pesos (58.6%) in foreign funds, and 120 million pesos in domestic funds. As to the foreign funds, it expects loans from the International Bank for Reconstruction & Development. The domestic funds, which at first was considered a combination of cooperative accommodations, supplier's credit, and plow-back, was changed to be the special funds from the government account. These foreign and government funds are to be applied jointly for the institution of a special fund for the shipping finance; to be administered by the Development Bank of the Philippines (DBP). The terms of accommodation proposed by DBP are: (1) 14 equal installments over 7 years (2) at an interest rate of 12% per annum (3) with repayment commencing 6 months after the date of completion of the construction work or 1 year after the date of validation of the agreement. The proposed terms of payment to the shipbuilder on the part of the shipowner are: (1) 20% of ship cost in 4 installments, 5% each at the end of contract agreement, commencement of work, launching and completion of work, respectively; and (2) payment of the remaining 80% to be rendered 1 month after the date of completion of the work by DBP to the suppliers of ship materials from the shipowner's account. The above financial plans are agreeable, except for the following problems concerning the amount of the necessary funds and the terms of accommodation.

3-2. Funds Requirements

According to the program, a total of 560 million pesos is to be used for the construction of cargo/passenger ships; the ship types included are A, B, C, and D which are in conformity with SEA standards; and the average cost per ship is about 10 million pesos approx. (380 million yen). Although the specifications of the four types of ships have not been fully clarified, the total funds required is estimated as follows.

(1) Comparison between the Philippines and Japan regarding ship costs:

(a) The Philippines is handicapped in that an average of about 60% of the ship cost must be appropriated for the import of ship materials. When the shipyard takes delivery of the imported materials, the prices are 15 to 20% upward of those in Japan due to the freight, insurance, and import charges in general (exclusive of customs duties), causing a 9 to 12% increase in the ship cost.

(b) The interest rate in the Philippines is about one and a half times that in Japan (12 to 15%). This forms the primary factor that raises the ship costs particularly when the shipyard has accepted a large loan.

(c) Labor cost in the Philippines is 40 to 50 yen per hour or one-eighth that in Japan. However, the man-hours required by the Philippine shipyard reach three to four times those by the Japanese counterpart because of the absence of fully equipped facilities and the difficulty in realizing effective production control due to the lack of experience. In this context, the labor cost in the Philippine shipyard can be roughly calculated at 5% of the ship cost as against about 10% in Japan, contributing toward reducing the ship cost by about 5%.

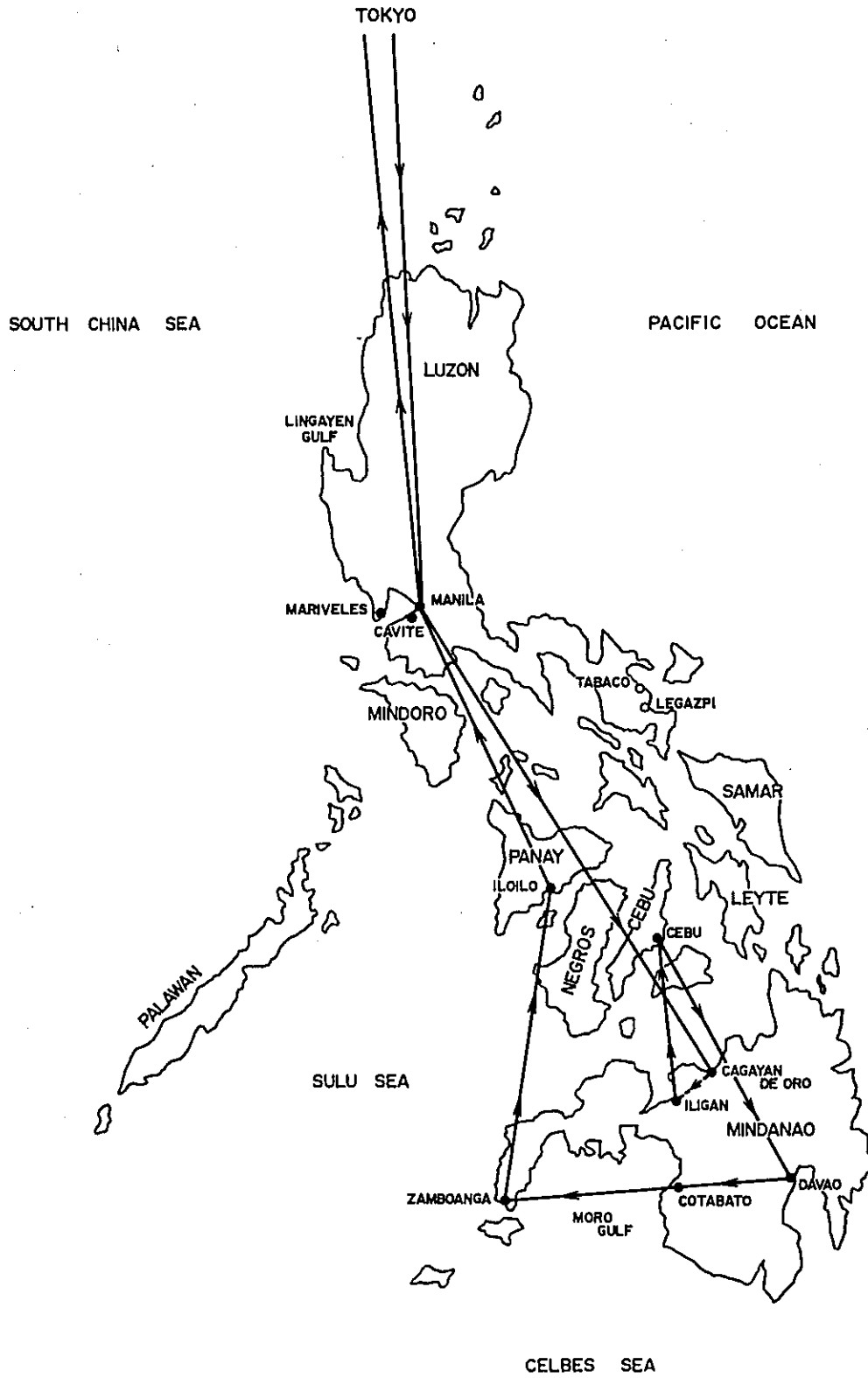
Considering these and other various factors, the ship cost in the Philippines will be about 5 to 10% higher than that in Japan insofar as the material cost, labor cost, and interest on loans are concerned.

(2) Fig. 1 shows the relation between length and cost of the ships for domestic use contracted in Japan in 1971. Although the SEA specifications are not clear, it is assumed by way of simplicity that SEA ships can be compared to general cargo boats (See Fig. 1). Judging from the ship's length, the cost of types A and B can be considered to be on the level of 10 million pesos. However, the SEA standards specify cargo boats larger in width than those in Japan, making a speed of 15 knots which is larger than 12.5 to 13.5 knots in Japan. Besides they are designed to carry passengers. Taking all these features into consideration, it is considered that the proposed type ships will be 20 to 30% higher in cost than the general cargo boats in Japan.

The sum of the cost increments of 5 - 10% and 20 - 30% stated in Items (1) and (2) respectively should be regarded as making the cost of type ships 25 to 40% higher than that of general cargo boats. Therefore, it is believed that the type A ship can be constructed at a cost of 10 million pesos or below but the cost of the other three types may exceed it.

In view of the probable rises in prices in the future and the manifest symptoms of the shortage of funds at the present stage, the mission considers that a considerable lack of funds will be unavoidable. Therefore, specifications of the standard types should be established and the construction plans promoted to provide a definite basis on which to make a reexamination of the financial plan.

TOUR ROUTE FOR THE ADVISORY MISSION



3-3. Financing Terms

It is quite natural that the DBP is designated the chief financing organ. Its eligibility is supported by the fact that it is one of the biggest financial organs for long-term-fund supply, that it has an experience of accommodating shipping businesses with loans from the KfW, that it has recently deepened connections with World Bank and succeeded in getting loans from it, and also secured its informal consent on the program under consideration. Competing with DBP in maritime loan business is the Private Development Corporation of the Philippines (PDCP), which, though run on a small scale, has been very active and made substantive achievements. Accordingly, the cooperative financing operations by these two institutions may preferably be studied at a proper time. In Japan, it is a common practice that private banking organs always cooperate with the Development Bank of Japan to finance shipbuilding projects. This system is favourable in two points; one is the resultant increase in the volume of funds, and the other is the possibilities of operating funds effectively and soundly through mutual checking on visible and invisible items.

There will be no hindrances in fund raising, because in addition to DBP the Philippine Government is likely to appropriate for the program 15 million pesos annually in ten years ahead. Also, the Asian Development Bank (ADB) seems likely to be in search of proper projects in which it invests through the hand of DBP.

The interest rate, 12% per annum, sounds too exacting for the shipbuilding. By the way, PDCP provides more moderate terms of loan with an interest rate of 10-3/4 to 12 per cent and a redemption period of 10 to 12 years including 3 years of deferred period. If the terms of a proposed loan are tighter, the shipowners will decline it and put off his shipbuilding plan. Ship's life is long, so that the shipowner is able to venture in his business only in a long-sighted view. (In Japan, the legal life is set at 18 years for freighters and 16 years for tankers). In Japan, therefore, administrative measures are taken in order that the investor can redeem his invested amount in ten years. If the redemption period is as short as 7 years, installment payable will outweigh profit, teasing the borrower to hunt for another money with which to balance his account. If such is the case, his business will be aggravated year by year and in the worst case go into bankruptcy.

In Japan, the term of the funds of the Development Bank of Japan for ocean-going ships is 13 years for regular liners (w/three years of deferred period) and 11 years for tankers and freighters (w/three years of deferred period), and that of the funds offered jointly by city banks is eight years. Even for domestic liners, the funds of the Development Bank of Japan are available for some 11 years.

Considering these and other various factors, it is recommended to review the terms, and if at all possible to set the redemption period at 10 years of which 3 years are set aside for delayed repayment and the interest rate at less than 10% p.a. In order to promote the replacement of overage ships, more

incentive conditions should be provided to those shipowners who do not mind doing "Scrap and Build".

3-4. Terms of Payment to the Shipyards

The shipyards are always distressed with hard business for want of money, and should be alleviated from money hunting. They should also be immune from taxes to be imposed on imported materials and supplies. In the present program, DBP is to pay for purchases while charging the amount paid to the shipbuilder's account. But this system of accounting involves onerous procedures in acquiring materials accounting for 60 - 70% of the total ship cost which could paralyse the clerical jobs of both the banker and the shipbuilder, and is not suitable for trading off various production problems incidental to shipbuilding such as procurement of materials and supplies, shop scheduling, manning, warehousing, coordination in process progress among shops, etc., and will also deprive the shipbuilder of its independency.

It is therefore recommended to provide special measures for the shipbuilder to be able to procure materials and supplies at its own discretion without any interference from others.

It is therefore advisable to pay to the shipbuilder in a planned manner; in Japan, for instance, 20% of the ship's cost is payable when a contract is agreed (to be made up by shipowner's own fund), 30% at the time of keel laying, 30% at the time of launching and the final 20% at the time of completion. For the procurement of imported goods, foreign exchange quota should be determined in proportion to the ship's cost.

4. GUIDELINES FOR PROMOTING SHIPPING AND SHIPBUILDING

4-1. To Reserve Bottoms for Stabilized Transportation

Safe and reliable transportation of materials is the mission assigned to the shipping business. And, it means more. It cannot be done without even in a single day for national economics and livelihood. It is therefore mandatory to maintain or increase the ratio of the value carried by the national cargo freighters to that by the foreign ones in order to provide for changeable climate in the shipping world. For the domestic shipping, the Philippine Government should prompt reorganization and amplification of routes and establishment of suitable shipping schedule in which shipping forces are deployed to balance the supply and demand without causing a fierce competition among shipowners. To this end, the Philippine Government may have to consider a registration or screening system for regular liner route operations and also a subsidy for propping up less profitable routes.

For domestic shipping businesses, the authorities should coordinate the dispatching of ships for each route to balance the supply and demand and provide operators qualification standard in which classification, size, reserved bottoms and port and harbour facilities and others are incorporated as criteria and on which the ship operators are granted franchise for a specific route. For cargo transport businesses, a proper registration system should be established to balance the supply and demand and to increase maritime safety. Once the registration system or screening system is established and put in practice, statistic survey should be conducted to clarify the trend in the shipping businesses, in order to promote maritime administration and improve and develop the shipping activities.

4-2. Demand for ships

The Philippine marine transportation business has been supported by old-fashioned and overage ships. A latent demand for new ships is quite large as already mentioned, but it has not yet been brought into light.

From the viewpoint of the security of human life and enhancement of national economics, immediate measures should be provided to meet such demand. In this 10-year plan, it is planned to build a total of 56 ships in 3 or 4 shipyards over 10 years. As described, however, profitable operation of shipyard cannot be assured by the planned construction of only 56 ships. For smooth implementation of the program, incentive measures should be taken to stimulate the shipowners to build new ships.

Although most of shipowners have a strong desire to build new ships, the largest problem they are facing is a lack of construction fund. It is therefore necessary for the government to concentrate efforts on the settlement of the

financial problem.

Ships serving on the coastal routes have been operated with no regard to safety and economic soundness over many years in the past. Lacking the necessary funds, only few of their owners evince positive attitude toward building new ships.

4-3. Marine Transportation Aid Policy

There have not been any governmental measures for the Philippine marine transportation but the Republic Law No. 1407 (Overseas Shipping Act) which was enacted in 1955. However the Philippine marchant fleet has barely managed itself on the strength of the law.

The government should provide the maximum possible financial aid to the shipping business because its development, whether coastal or otherwise, contributes largely to the growth of national economy.

From the viewpoint of taxation system, ship's registry tax, tax on fixed assets, import duties for shipbuilding materials and related products should be mitigated or exempted, and a special depreciation system should be introduced as well.

Needless to say, such measures should be taken for those shipowners who have cooperated with the government in enforcing its policy.

Further, if any shipowners who are short of funds wish to build new ships with which to replace overage and less profitable ships and at the same time meet the marine transportation demand, the Government should provide loans or help them gain low-interest funds from financial institutions.

In order to promote the construction of new ships and encourage the enterprises, it is worth while to consider a system in which the ownership of new ships is divided between the government of financial institutions on the one hand and the shipowners on the other.

4-4. Building the Standardized Ships

The Philippine shipping circles are greatly in need of new ships to replace overage and less profitable vessels. But the shipbuilding industry is now facing too many problems to cover up the demand; the number of shipyards and related subcontractors is very small, and the facilities and skilled labour force are deficient. In order to overcome these problems, it is recommended to build several types of standard ships that may reflect the common denomination of passenger and cargo transport and route conditions.

The merits of standardization are as summarized below.

- (1) Engineering period and cost are saved once drawings are obtained.
- (2) Construction period is shortened because of expected standardization of materials and processes as well as improvement in workers' skill.
- (3) Mass production is possible through standardization and quality improvement of harnessing equipment and materials including main engine. This makes it easy to secure the equipment required for replacement and repair.
- (4) Ship inspection can be conducted simply in a planned manner. Also, the standardization goes a long way toward improvement in the skill of workers and toward repletion of the inspection system.
- (5) Education in seamanship can be simplified, and efficient deck hands and seamen can be raised with ease. Also, the skill of naval architects as well as the material quality and building workmanship can be improved, which will reduce the shipbuilding cost and stabilize the shipowner's economics. The 10-year program will provide a good chance for the standardization of ships. Administrative measures should be taken by the Government to grant preferential financial aids (investment funds) to shipowners building standard ships over other owners.

4-5. Improvement of Ports and Harbours

In the Philippines, the serious shortage of port and harbour facilities is causing traffic jam and tarry in cargo handling. Berthing and mooring facilities are also poor and superannuated. To put it mildly, some ports cannot be called at without sacrificing ship's safety. The consolidation of ports and harbours is the pressing need for efficient and safe shipping operations for both domestic and foreign trade. Most of the shipping agencies the mission visited were desirous of expanding their business and replacing their overage ships, but they all expressed an equal or stronger hope for the improvement of port and harbour facilities.

The improvement of the port and harbour facilities is undertaken by the Public Works Bureau. Some large ports are under way for improvement with foreign loans. These are the favoured few, and the improvement of host of ports and harbours is far behind the schedule. The Government is therefore urged to investigate actual status of ports and harbours and map out a feasible improvement plan compatible to the overall improvement plan as well as to specific conditions of each individual port.

The improvement work involves much difficulty and requires expert knowledge. For the planning and construction of ports and harbours, therefore, a survey should be conducted by specialists.

5. GUIDE TO SHIPBUILDING RATIONALIZATION PLAN

5-1. Outline and Goal of Shipbuilding Facilities

The Philippine shipbuilding industry is in its initial developing stage, both in techniques and equipment capacity. It is earnestly hoped that the industry will take this opportunity to improve its facilities and technical level so that it will grow into a full-fledged one.

An expansion goal of shipbuilding facilities can be determined according to the present shipping program. Table 2 shows the lineup of the existing equipment for shipbuilding and repair.

Table 2. Existing shipbuilding and repair facilities
(Classified by capacity)

Nominal tonnage	Slipways (for shipbuilding & repair)	Berths (for building new ships only)	Docks (for repair only)	Total
Below 500G/T	34	3	1	38
501G/T - 1,000G/T	4	8	-	12
1,001G/T - 2,000G/T	3	-	1	4
2,001G/T - 5,000G/T	4	-	-	4
5,001G/T - 10,000G/T	-	-	1	1
10,001G/T - 20,000G/T	-	-	-	-
Above 20,001G/T	-	-	-	-
Total	45	11	3	59

On the other hand, the stochastics on the future annual demand for bottoms require the shipbuilding and repairing facilities to be as follows, provided that slipways now used both for repair and shipbuilding will be used only for repair in the future.

Table 3. New shipbuilding facilities to be installed

Nominal tonnage	Tonnage (G/T) to be built in 1971-75	New ship- building facilities to be installed	Existing instal- lations	Balance
Below 500G/T	25,800	20	3	-17
501G/T - 1,000G/T	14,800	8	8	0
1,001G/T - 2,000G/T	11,100	3	-	-3
2,001G/T - 5,000G/T	63,400	7	-	-7
5,001G/T - 10,000G/T	96,700	7	-	-7
10,001G/T - 20,000G/T	42,300	2	-	-2
Above 20,001G/T	17,900	1	-	-1
Total	272,000	48	11	-37

As will be clear from the above table, it is believed that facilities for ships of over 1,000G/T should be fortified without delay, setting aside those below 500G/T. As the above-mentioned figures are based on various assumptions, it is desirable to correct them according to the actual conditions. If the above amplification is accomplished, the demand in several years ahead of 1975 will be filled by increasing the rotation of shipbuilding berths.

However, it would not be easy to tackle with the whole of the improvement plan from the outset. Although the construction of oceangoing ships is a matter of prime concern, but as well the international competition in this field is very fierce as high performance and high quality are prerequisite to such ships. To raise the industry's structures, visible and invisible, up to the international level, is really a time-consuming business.

A ready and working method is to allure foreign enterprises having many years of experience and abundant technical knowhow about shipbuilding, and make them to build new facilities and import skilled workers. To realize this, it would be desirable for the government to offer as much assistance as possible such as the use of state-owned land, security, etc.

With regard to coastal ships, on the other hand, the mission has concluded that it is possible for the Philippines to build them themselves by rationalizing and expanding some of the existing promising shipyards, and has selected the following ten biggest companies.

BNS, Cebu Shipyard, Dynamarine Shipyard, IDECO, El Varadero de Manila, Republic Drydocks, Sandoval Shipyards, Luzon Slipway, David Shipyard, PICMAW. From these ten companies, the mission has chosen the following four enterprises as the most promising ones, taking into account their business and siting conditions and their past achievements.

BNS (Bataan National Shipyard)
Cebu Shipyard and Engineering Works
Sandoval Shipyards
PICMAW (Philippine Iron Construction & Marine Works)

Coastal ships can be built with comparatively small scale companies which can easily be protected against the competition from other nations by establishing proper tariff barriers. Furthermore, if the Philippine shipbuilding industry is stabilized by such small builders, it can be expected that the way will be opened for larger scale shipbuilding. In this respect, it may be said that ten-year program of the Philippine Government is pertinent. It is to be noted, however, that the above-mentioned four companies are not necessarily large enough in capacity.

In this chapter, a general view concerning the rationalization of shipbuilding industry is given, with some suggestions made on the four companies.

5-2. Plans for Development of Shipbuilding Industry

5-2-1. Modernization of Facilities and Rationalization of Shipbuilding

There appears a tendency for the Philippine shipyards to build ships under a make-shift policy and they lack consideration about the future.

For the purpose of expanding shipbuilding industry, it is essential for shipyards to make thorough prior studies for construction of highly efficient facilities capable of building ships of good quality, and to lay up proceeds and to invest for further development.

Of the shipbuilding facilities, the slipway is the most important. The slipway employed generally by Philippine shipyards is not suitable for accommodating large ships, because its rails and transfer cars are small. It is believed that these slipways will present no problems for some time to come in building coastal ships. But when installing new shipbuilding berths, ordinary shipbuilding berths will perhaps be more economical and shallow docks with a flat bottom will be most desirable for convenience of shipbuilding.

Cranes will be necessary because they contribute to the shipbuilding efficiency. Construction tonnage is directly restricted by the crane capacity with the increase of production. The mobile-cranes which are usually used in the Philippines are small in capacity and efficiency. It is desirable for the sake of efficiency to install traveling cranes although they are expensive.

If layout of the cranes is devised well, they can be utilized for assembling work on land and at the fitting-out basin in addition to the erection work in berth for increased working efficiency.

Furthermore, shipbuilding methods also should be changed over to the

so-called block building from the present method in which the keel is laid, ribs built and then boarding made. In order to accomplish the change-over, fabricating shops (ranging from marking and cutting to small assembling work) must be modernized. The investment for this purpose can be well paid off because such modernization would more than offset the investment cost, improving product quality and increasing the shipbuilding efficiency.

5-2-2. A Plan for Optimization of Operation

Turnover rate of shipbuilding industry is usually indicated by the tonnage of the ships built or the amount of steel used. The tonnage or steel amount does not mean the soundness of the shipyard operation, however. It should be assessed in contrast to the installation and manpower. Namely, a minimum necessary level of operation (marginal point) does in fact exist with respect to any given system of production, and shipyard operation should be planned and pushed forward to clear over this point.

Philippine shipbuilding enterprises hitherto have been unable to make such plans or to expand or improve facilities in the absence of stabilized ordering support. But on this occasion, they should estimate demands exactly, canvass orders, plan the operation suitable to their facilities equipment, and devote themselves to a stable operation.

5-2-3. Payability of Shipyard Operation

As mentioned repeatedly, shipyards should raise output to capacity and pay off the investment by profits for further growth.

A rough estimate is made below on how many tons of ships should be built and how much should be earned in profit if the following equipment investment is made for building coastal ships.

Table 4. Equipment investment necessary for building coastal ships

Item	Description	Quantity	Value (mil. ¥)
Shallow dock	120m x 20m x 7m	1	100
Ancillary equipment	Gate, block, water-filling pipe and valve, drainage pump	1 set	30
Outfitting basin	120m x -3m with electric power supply and mooring equipment		40

Item	Description	Quantity	Value (mil. ¥)
Crane	20t/5t x 15m/25m with crane rails	1	90
Surface plate	Concrete, steel-framed, with a simple mobile roof	1,000m ²	20
Fabricating shop	20m x 80m with lighting and water service system and 10t overhead-crane		60
Gas plant and piping			5
Power plant and wiring	1,000KVA electric power plant with wiring	1 set	25
Welding machine, and tools	50 sets of welding machine with accessory tools		10
Air compressor and piping	300HP x 1 with accessories		20
Total			400

Note: The installations were estimated on the basis of prices in Japan and standard environmental and topographical conditions. In addition, land, dredging, roads, warehouses, outfitting shops, offices, locker rooms, dining rooms, transportation vehicles, tools and so on, as well as the infrastructive and related industries should be taken into account. These items, however, were excluded from the estimate.

Meanwhile, the mission examined the profitability of a shipyard in two cases; one for producing two domestic passenger/cargo liners a year and the other for four same ships a year. The investment cost recovery is computed with the gross profit (total ship cost less cost of materials, labour and indirect cost, utility and indirect cost, expenditure, overhead cost, commission, general management cost, not including repair funds, interest, loans and dividends) set at 10 per cent of the total cost of a ship. (For details, refer to the attached table.)

Table 5. Calculation on profit of shipyards

	Case I	Case II
(1) Proceeds	¥800 mil./year (¥400 mil. x 2 ships)	¥1,600 mil./year (400 mil. x 4 ships)
(2) Net profit before tax	Black figures from the sixth year	Black figure from the initial
(3) Surplus profit	Accumulated red figures will disappear in the 13th year.	Accumulated red figures will disappear in 1 year after commissioning
(4) Operating funds	Loans will reach a peak in the 11th year, amounting to ¥275 mil.	Loans will reach a peak 1 year before commissioning, amounting to ¥447 mil.
(5) Equipment investment	¥400 mil. covered fully by loans.	Same as Case I.
(6) Time required for investment recovery	13.6 years.	5.1 years

- a. Price of one ship is estimated at 400 million yen.
- b. The annual output will be lower than estimated since it is set at case II.
- c. Equipment investment is assumed to be fully covered by loans, of which the terms are: 2 years of deferred period; 10 year redemption; interest rate, 10%.
- d. It is assumed that cost and revenue are concurrent and that the operating fund is to cover up the accumulated loss only.

As will be clear from the above, shipbuilding industry demands huge capital input and takes a long period of time before it turns profitable.

Moreover, not only direct costs such as wages and cost of materials, but repaid funds and interest should be included in the price of a ship. If the turnover rate is low, such costs will burden the shipyard, bereaving it of competitive power. Accordingly, shipyards should lift the level of shipbuilding technique and improve the production capacity as soon as possible.

From this point of view, it is desirable to limit the number of shipyards in order to achieve the goal of building 56 coastal ships under the program.

However, there are many shipyards which can fill the conditions of the program, and some of them have the possibility of building oceangoing ships in the future.

Taking the circumstances into account, all these shipyards should be counted and the number of ships should not be limited to 56 so that other ship-owners can participate in the program under the government guidance.

Reflecting upon all those possibilities, the mission considers it desirable that the above-mentioned four shipyards be given assistance to improve their facilities and capacities for the program implementation.

5-3. Concrete Improvement Measures for Existing Shipyards

Concrete improvement measures for the existing four shipyards in the Philippines, as already taken up in 5-1, will be discussed here. The following recommendations are based merely on the impression given by a general and very short-term inspection of each shipyard. Therefore, further inspection and analysis will be required in order to implement them.

(a) Bataan National Shipyard (BNS)

This company's facilities are rather old-fashioned and not well cared for. While its 2300G/T slipway could play an important part in building up coasters, its rails, etc. would require a large scale repair. This slipway is isolated at the corner of the compounds, and should be reinforced with a utility system (electricity, gas, air) and a block erection shop-cum-stockyard set up in its neighbourhood. Also it should be provided with a movable roof to shut off rainfall and direct sunlight for the purpose of increasing working efficiency. In other respects, this shipyard can be said to be comparatively well equipped. It is to be hoped above all things that organizational and management consolidation as well as training of technicians and foremen will be prompted for systematic and efficient operation of the facilities now available. It is also necessary to set up a springboard for the production of foreign trade liners.

(b) Cebu Shipyard & Engineering Works, Inc.

This shipyard is most actively operated. While repair is its main work at present, steady progress is being made to build up new ships. Its future is predictable. Further development of this company will be accomplished as follows. As for equipment, a crack shipway of 4,000 tons is almost completed, by which fairly large coasters will be built. Besides, this shipway is to be equipped with a 35-ton traveling crane for powerful material handling. It is believed that due consideration has been given to the adjustment of gas, electric power, and air supply to the slipway, though their actual

conditions are not known.

The company plans to divide the management system into a shipbuilding department and a repair department shortly in order to embark shipbuilding business. The layout of this shipyard is somewhat poor, and may hamper the erection work; the slipway, whose environs are limited in area, is blocked by a machine shop, and there is no regular transport route connecting the shipway to other places. Ironwork shop, which the mission could not find, should be arranged where transportation to shipway or neighbouring assembly shops is easy. But if it is possible to procure the open space adjacent to the slipway of 4,000 tons, it would be better to set up steel materials stockyard, ironwork shop and block assembly shop there to compose a shipbuilding department. It is essential to ensure the procurement of materials in order to run shipbuilding processes smoothly. However, the materials have to depend on imports for the present, and it is recommended to install a warehouse-cum-outfitting shop, with center around material stockpile, inspection and assembling, in order to operate it systematically without causing delivery delay.

(c) Sandoval Shipyards

The Cebu shipyard is just at the stage of building its slipway, and there is no shipbuilding equipment worth mentioning. But it has been chosen because of the following reasons:

(1) This site contains no remarkable defects, but has a pliability for layout, and (2) regular freighters of the 1200 GT type were once constructed here.

For future development it will be necessary to utilize an extensive site and hinterland, to adjust the coast-line, and to rationalize flow of materials and construction process. As a matter of course, it is quite necessary to have such equipment as those mentioned as to BNS, Cebu Shipyard & Engineering Works.

Another problem is the shallow inlet in front. Therefore, it would not be easy for the shipyard to develop into a large-scale one in the future, though it is blessed with a space. This should be taken into consideration for the layout and expansion of the facilities. It goes without saying that the front of the slipway and the mooring quay needs to be dredged. It is said that various plans have been examined to solve problems incidental to the shallow waterway, but the dredging will be the best solution from the economic point of view. Electric power, waterway and road transportation, communications facilities and other various infrastructures are poor, and direct aid from central or local government will be required in order to support industrialization.

(d) PICMAW (Philippine Iron Construction and Marine Works)

As for this company, it will be necessary to thoroughly inspect whether it is adequate or not for the existing slipway of 1,000 tons to construct coasters. In other words, there is a constant fear about the depth of the frontal water because of the sand carried by the Cabling river and the resulting stranding. In order to solve this problem, it will be necessary to procure the adjacent land owned by another company, which will make it possible to rearrange the layout drastically. The yard's operating efficiency will be increased if cranes and other equipment are installed there. The installation of ironwork shop is partly under way.

It is necessary to finish it as soon as possible and consolidate the slipway, its appurtenances including block stockyard, assembling yard, transport route, etc. The machine shops are well accommodated, but is of secondary importance in the shipbuilding department. Therefore, full examination and consolidation are required of the flow which relates to ironworks and of the flow of fitting work processes which lays stress on material handling. By adopting a spacious and functional layout including slipway and cranes, considerable development can be expected.

(NOTE :)

While the four companies have been picked up, it does not mean that all other shipyards are insignificant. Especially IDECO (Iloilo Dock and Engineering Co.) excels in both installation and technology. Moreover, it has launched a large-sized barge (15,000 DWT) recently, and has many years of experience in the repair of ocean-liners. This company however is affiliated with shipping department of Lusteveco (Luzon Stevedoring Co.) and is obliged to construct or repair only the ships of Lusteveco's own. This is the reason why it has been excepted. Though Dynamarine Shipyard, Luzon Slipway is staffed with excellent technicians, it has been also excepted. For it is considered that its geography is poor (frontal sea area faces the shallow and narrow Navotas river) and will restrict construction to small-sized coasters only. Besides, El Varadero de Manila is conveniently located and has good equipment and techniques. Though this company is planning to expand its site by procuring the adjacent land, it has no future plan but to engage only in repairing ships.

5-4. Matters Related to Reorganization and Amplification of Shipbuilding Industry

5-4-1. Assistance to the Shipbuilding Industry

The shipbuilding industry stands on a complex structure, and its development calls for considerations given from many angles. Many-sided view is of prime importance in bringing the shipbuilding industry to success. It is of utmost necessity for the Philippines, which is now in the stage of promoting industrializa-

tion, that the government should protect its shipbuilding industry. The shipbuilding industry is actually treated as one of the industries stipulated in Investment Promotion Act.

In Japan, about one hundred years ago when the shipbuilding industry was about to stage it was backed up by the government for the military purposes. After the World War II shipbuilding yards were left in a state of devastation and enervation.

Many of naval architects, however, began to work on shipbuilding again and at the same time they were given financial assistance from government, which enabled Japan to restore its place in the shipbuilding world. The nature of the assistance was as follows:

(a) Financing for improvement in equipment by the Development Bank of Japan.

The Development Bank of Japan advanced funds at an interest rate of 8.2% per annum payable over a period of 8-10 years to make up 30% of the cost of slipways and docks.

(b) Taxation

The tax on various reserve funds for industries and machinery stipulated in the acts of Industrial Rationalization and Modernization of Smaller Enterprises was deferred, and at the same time accelerated depreciation for machinery and income tax deduction were put into effect.

5-4-2. Enforcement of Safety Regulations and Establishment of Inspection System

It is attributable to incomplete statutory measures for navigational safety that the demand for shipbuilding has not materialized in spite of the fact that the Philippine coastal shipping today is contented with overage vessels.

This is really a deplorable situation as many passengers are always at the risk of their life. Therefore it will be necessary to enforce practical laws and regulations concerning ship's operations and construction. Overage ships should be ruled out by these laws and regulations, for instance, by confining their routes closer to the coast or on smoother water depending on their length of service.

Furthermore by taking this action ships built on a ten-year program can be maintained in a proper condition, the level of industry can be raised and as a result the country will improve its overseas confidence.

5-4-3. Improvement of Repairing Facilities

For the implementation of the above-mentioned laws and regulations,

however, the present facilities for repair are too poor. In addition, the periodical check-up of shipping required by the laws and regulations has not been fulfilled because repair yards are not equipped with docks.

Assuming the tonnage listed in Table 3, which is required for the expansion of shipping in the Philippines, is supplied by building or purchasing ships, the amount of equipment for repair required to maintain ships in the proper conditions would be as tabulated below.

Table 6. Repairing facilities required

Nominal tonnage	Estimated total tonnage at the end of 1975	Repairing facilities required at the end of 1975	Currently required repairing facilities	Balance
Below 500G/T	509,400	45	35	-10
501 - 1,000G/T	65,500	3	4	+1
1,001 - 2,000G/T	78,200	3	4	+1
2,001 - 5,000G/T	401,300	5	4	-1
5,001 - 10,000G/T	612,600	5	1	-4
10,001 - 20,000G/T	346,100	2	-	-2
Above 20,001G/T	151,700	1	-	-1
Total	2,164,800	64	48	-16

This shows that the demand for repairing facilities will be augmented.

Ocean-going ships have little or no problem at present as it is possible to utilize repair yards in foreign countries and they are controlled strictly by ship classification societies. On the other hand, overage coast-sailing ships need to be checked up and repaired for the sake of safe navigation and at the same time they should be restricted in movement according to their serviceability so that their replacement can be expedited. For this purpose, the government should provide assistance to repair yards.

5-4-4. Promotion of Related Industries

Today most of the materials for shipbuilding depends on import but it is necessary to promote the related industries such as iron and steel industries and machine industry and encourage domestic production in order to make shipbuilding industry successful and save the foreign currencies reserved.

The Philippine government has a plan to reconstruct IISMI and manufacture steel plate for shipbuilding. It is therefore expected that the self-sufficiency with

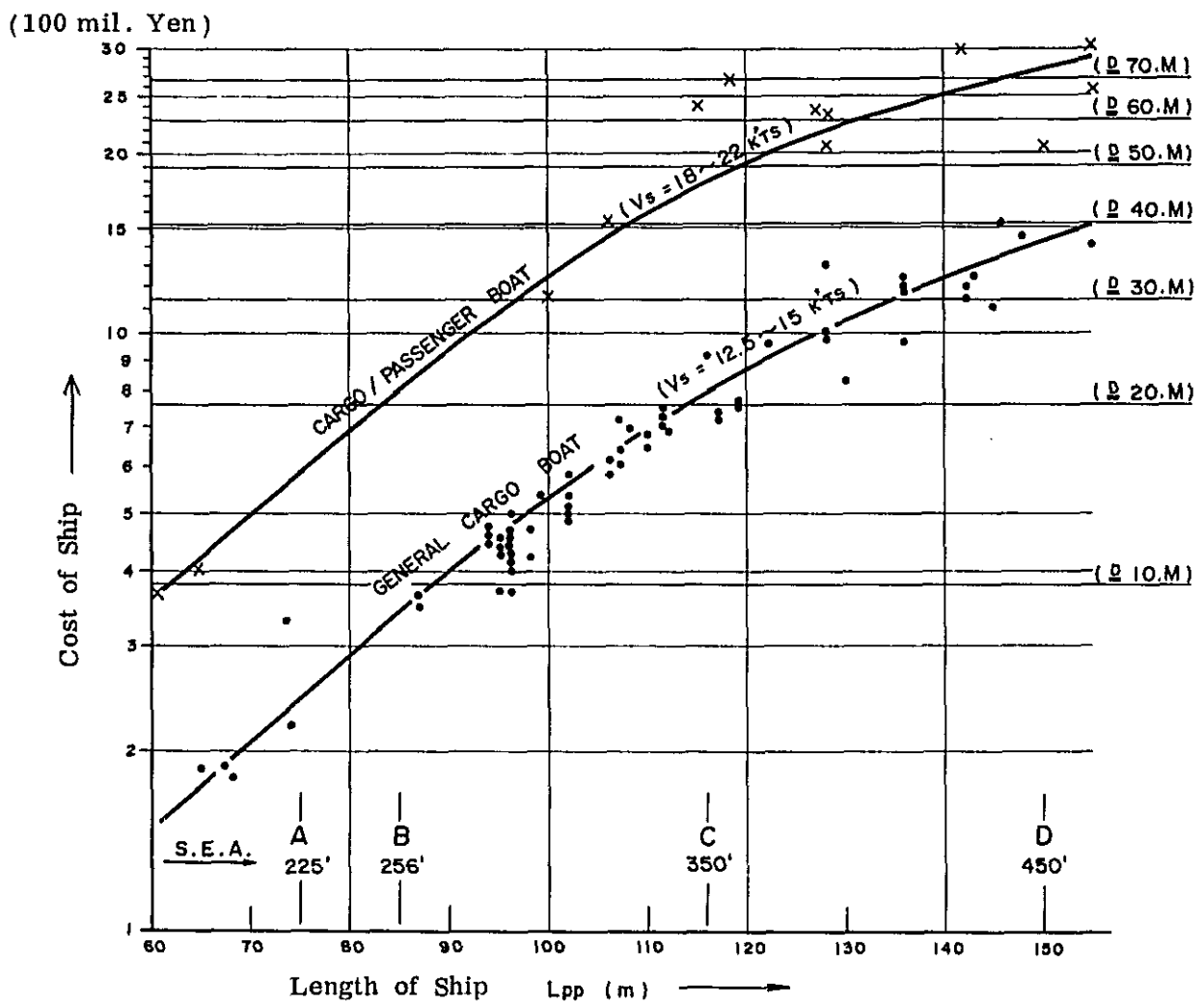
domestically produced steel plate for shipbuilding will be attained. In manufacturing the related products at home, it will be necessary to promote development of the related industries whose equipment and techniques can be applied to general machine industry, because the number of ships to be built under the program will be limited and demand for the related products consequently small. In promoting important related industries such measures as favorable treatment in taxation, accommodation of equipment funds and depreciation with a premium should be taken.

5-4-5. Training of Engineers

It is needless to say that there are excellent shipbuilding engineers in the Philippines but they are not sufficient in number in order to make shipbuilding industry successful. Therefore it is necessary not only to increase the training courses of shipbuilding technique in the engineering departments of universities but also to train workers at welding factories, engine-shops and electric plants for improvement of their skill. Shipbuilding engineers should acquire the knowledge about operation and management, introduce the improved and inovated production and management methods best fitted to the conditions and abilities of their shipyards in the course of planning and implementing the shipbuilding program. As welding is a decisive factor that determines both the quality and safety of a ship, it is advisable to establish a state examination system for welding engineers. As for naval architects, an overseas naval architects training center is to be established in 1974 in Japan, which will be of great service to this purpose.

It is the sincere hope of the mission that the foregoing findings of its survey will prove useful in mapping out the basic shipping and shipbuilding reconstruction program and that the Philippine shipping and shipbuilding industry will pursue a smooth course of development in future.

Fig. 1 Relation between Length and Cost of Ships (contracted 1971)



Summary of Economic Evaluation (Unit: Million Yen)

	Year														
	-1st	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th
(Case I)															
(1) Sales	-	800	800	800	800	800	800	800	800	800	800	800	800	800	800
(2) Cost of Sales	-	720	720	720	720	720	720	720	720	720	720	720	720	720	720
(3) Depreciation	-	57	49	42	36	31	26	23	19	17	14	12	11	9	8
(4) Interest on Borrowings (Operating Fund)	12	22	22	24	25	26	27	28	29	29	29	29	28	24	20
(Facility Fund)	15	35	39	35	31	27	23	19	15	11	7	3	1	-	-
(5) Profits before Tax	-27	-34	-30	-21	-12	-4	4	10	17	23	30	36	40	47	52
(6) Taxation ((5) x 30%)										7	9	11	12	14	16
(7) Retained Earnings	-27	-34	-30	-21	-12	-4	4	10	17	16	21	25	28	33	36
Payroll Calculations															
(8) Accumulation of retained earnings	-27	-61	-91	-112	-124	-128	-124	-114	-97	-81	-60	-35	-7	26	62
(9) Accumulated Depreciation	-	57	106	148	184	215	241	264	283	300	314	326	337	346	354
(10) Payroll Fund Accumulated	-27	-4	15	36	60	87	117	150	186	219	254	291	330	372	416
(11) Accumulation of Initial Investment	300	400	400	400	400	400	400	400	400	400	400	400	400	400	400
(12) Balance ((11) - (10))	327	404	385	364	340	313	283	250	214	181	146	109	70	28	-16

- Notes: (1) Initial Investment 400 Million Yen
(2) Annual Sales 800 Million Yen
(3) Profit/Sales Ratio (before Depreciation) 10%
(4) Payroll Period of Initial Investment 13.6 Years

Summary of Cash Flow (Unit: Million Yen)

	Year														
	-1st	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th
(Case I)															
Operating Cash-Inflow	-	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Operating Cash-Out-Flow	216	720	720	720	720	720	720	720	720	720	720	720	720	720	720
Non-Operating Cash-Outflow															
Interest Payment															
(Operating Fund)	12	22	22	24	24	25	26	27	28	29	29	29	29	28	24
(Facility Fund)	15	35	39	35	31	27	23	19	15	11	7	3	1		
Tax Payments											7	9	11	12	14
Facilities Payment	300	100													
Balance Over and Short	-531	-67	19	23	25	28	31	34	37	40	37	39	39	40	42
Finance															
Borrowings for Operating Fund	231	-	11	17	15	12	9	6	3	-	3	1	-	-	-
Borrowings for Facility Fund	300	100													
Repayment of Operating Fund		33												29	40
Repayment of Facility Fund		30	40	40	40	40	40	40	40	40	40	40	40	10	
Balance Over and Short	531	67	-19	-23	-25	-28	-31	-34	-37	-40	-37	-39	-39	-40	-42

Notes: (1) Interest Rate 10% annually
 (2) Repayment of Facility Fund Within 10 years after 2 year deferred repayment

Summary of Economic Evaluation
(Case II)

(Unit: Million Yen)

	Year						
	-1st	1st	2nd	3rd	4th	5th	6th
Sales	-	1,600	1,600	1,600	1,600	1,600	1,600
Cost of Sales	-	1,440	1,440	1,440	1,440	1,440	1,440
Depreciation	-	57	49	42	36	31	26
Interest on Borrowings							
(Operating Fund)	22	40	32	27	23	18	13
(Facility Fund)	15	35	39	35	31	27	23
Profit before Tax (30%)	-27	28	40	56	70	84	98
Taxation	-	-	12	17	21	25	29
Retained Earnings	-27	28	28	39	49	59	69
Payroll Calculation							
Accumulation of Retained Earnings Accumulated	-27	1	29	68	117	176	245
Depreciation Payroll Fund Accumulated	-	57	106	148	184	215	241
Accumulation of Initial Investment	-27	58	135	216	301	391	486
Balance	300	400	400	400	400	400	400
	327	342	265	184	99	9	-86

- Notes: (1) Initial Investment 400 Million Yen
(2) Annual Sales 1,600 Million Yen
(3) Profit/Sales Ratio (Before Depreciation) 10%
(4) Pay-roll Period of Initial Investment 5.1 Years

Summary of Cash-Flow (Case II)

(Unit: Million Yen)

	Year	1st	2nd	3rd	4th	5th	6th
	-1st						
Operating Cash-Inflow		1,600	1,600	1,600	1,600	1,600	1,600
Operating Cash-Outflow	432	1,440	1,440	1,440	1,440	1,440	1,440
Non-Operating Cash-Outflow							
Interest Payment							
(Operating Fund)		22	40	32	27	23	18
(Facility Fund)	15	35	39	35	31	27	23
Tax Payments				12	17	21	25
Facilities Payments	300	100					
Balance Over and Short	-747	3	81	81	85	89	94
Finance							
Borrowings for							
Operating Fund	447						
Facility Fund	300	100					
Repayment of							
Operating Fund		103	51	41	45	49	54
Facility Fund			30	40	40	40	40
Balance over and short	747	-3	-81	-81	-85	-89	-94

Notes: (1) Interest Rate 10% annually

(2) Repayment of Facility Fund Within 10 years after 2 year deferred repayment

