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**ECONOMIC AND SOCIAL COMMISSION
FOR ASIA AND THE PACIFIC**

**SEMINAR-CUM-TRAINING COURSE ON
TECHNICAL AND OPERATIONAL
ASPECTS OF SHIPPING**

LECTURES AND COUNTRY REPORTS

*17 March - 12 April 1975
Bangkok*

CORRIGENDUM

Seminar-cum-Training Course on
Technical and Operational Aspects of Shipping
17 March - 12 April 1975, Bangkok

1. — On contents, please insert between Nos. 5 and 6 the following: “5(a)
Project appraisal and choice using discounted cash flow analysis”
2. — Lecture on “Project appraisal and choice using discounted cash flow
analysis” is to be inserted between pp. 29 and 30
3. — On contents, please insert between Nos. 6 and 7 the following: “6(a)
The cost of ships’ time”
4. — Lecture on “The cost of ships’ time” is to be inserted between pp. 33
and 34.

Economic and Social Commission
For Asia and the Pacific

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INTRODUCTION

The Seminar-cum-Training Course on Technical and Operational Aspects of Shipping was held at Bangkok from 17 March to 12 April 1975. It was organized by the Economic and Social Commission for Asia and the Pacific (ESCAP) with the financial support of the Danish International Development Agency (DANIDA) and in co-operation with the United Nations Conference on Trade and Development (UNCTAD) and the Inter-Governmental Maritime Consultative Organization (IMCO).

The Seminar-cum-Training Course was attended by 31 participants from the following 14 countries of the ESCAP region; Bangladesh, India, Indonesia, Iran, Khmer Republic^{1/}, Malaysia, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Republic of Viet-Nam^{2/}, Singapore, Sri Lanka and Thailand.

The lecturers provided for the seminar were drawn from ESCAP, UNCTAD, IMCO, the United Kingdom and Denmark.

In his opening address, Mr. J.B.P. Maramis, Executive Secretary, ESCAP stressed the need for regional shipping to adapt itself to increasingly specialized types of ocean transport and to diversify composition of fleets.

This was the first seminar-cum-training course of its type to be organized for the ESCAP region. It was designed to give the participants a comprehensive review of the various technical and operational aspects of shipping. Each participating country was invited to prepare and present a country paper on the various aspects of maritime development. This provided the participants with an excellent opportunity to exchange views on many of their common problems and the various alternative solutions that they had found. It also brought out several areas in which regional or subregional co-operation could be promoted.

The ESCAP secretariat deeply appreciates the generous financial assistance provided by the Government of Denmark in financing this training course and this publication.

^{1/} Now Cambodia.

^{2/} Now Republic of South Viet-Nam.

TEXTS OF LECTURES

REGIONAL MARITIME REVIEW*

This Seminar-cum-Training Course has been organized in co-operation with UNCTAD and IMCO. It is being financed by the Danish International Development Agency (DANIDA). The training course is designed to bring together senior executives and other key operational personnel in the maritime industry and governmental officials responsible for maritime development in the countries of the region for an exchange of views and training in modern technical and operational aspects of the maritime industry. The curriculum of the seminar covers a wide range of topics to provide a broad base. The subjects included in the curriculum will be dealt with in detail and an attempt will be made to find answers or possible solutions to many questions and problems, not only those which may be common to the region but also those which may vary among individual countries. There are many ways in which the shipping problems of a geographical region can be considered. Each method of consideration depends on purposes to be served and each is valid for its own purpose. During the course of the lectures you will be welcome, in fact encouraged, to raise questions on any points you may wish to and stimulate discussions on the future evolution and structure of shipping services, including ports in the ESCAP region.

I will now give a brief review of the broad aspects of maritime development in the ESCAP region in the context of current developments in world shipping. As shipping operations transcend national boundaries, they have to be viewed in a world-wide context.

In 1972, the volume of world seaborne trade amounted to 2,861 million metric tons, registering an increase of about 6 per cent over 1971. In that year, the ESCAP developing countries generated between them 19.9 per cent of the world seaborne trade, showing a growth of about 10 per cent over the previous year, which, in absolute terms, increased by 51 million metric tons. No reliable regional data are available to show the share of ESCAP shipping in the carriage of seaborne cargoes.

The combined fleets of the ESCAP developing countries in 1973 accounted for 3 per cent of the world fleet (dwt). The fleet increased from 2.7 per cent in 1972 to 3.0 per cent in 1973 and, in absolute terms, it registered a growth of 21.4 per cent over the previous year.

However, the increase has been unequal and has varied greatly among the developing ESCAP countries: some have registered a notable growth while others have declined. Countries that registered an increase in 1973 over the preceding year are: Malaysia, Sri Lanka, Singapore, Iran, Thailand and India. Countries that registered a decline are: Republic of Korea and Pakistan.

The rate of acquisition of new ships has also varied greatly among the developing countries of the region. New ships on order by these countries are: India — 108 (4.5 million dwt); Singapore — 43 (3.4 million dwt); Malaysia

— 4 (116,000 dwt); Indonesia — 3 (70,000 dwt); Nauru — 1 (31,200 dwt); Pakistan — 2 (21,750 dwt); Republic of Korea — 2 (8,250 dwt); Sri Lanka — 1 (1,200 grt).

India has achieved impressive results in its maritime development. It now occupies sixteenth position among the world maritime nations and has set a target of 9.6 million tons (gross) by the end of its eighth five-year plan ending 31 March 1979. This achievement is largely due to the Government's active assistance in fleet development through: grant of loans at concessional rate of interest; release of foreign exchange for 20 per cent down payment for ship purchases; permitting purchase of ships as an item of trade on local currency payment under bilateral agreements with shipbuilding countries, grant of 40 per cent development rebate for new ships, exemption of the shipping industry from wealth tax; and expansion of shipbuilding facilities. Certain other countries are providing some assistance for fleet development in one form or other. Singapore has also shown accelerated shipping development. However, some of the tonnage existing or on order may not belong to Singapore nationals. It may be owned by foreign interests and registered in Singapore under its 'flag of convenience'.

The need for diversification of the national fleets of the developing member countries has assumed greater importance with the changing maritime scene. A definite gradual trend towards diversification of these fleets can now be seen.

Singapore, the Republic of Korea, India, Indonesia and Iran own some small tanker tonnage, which increased from 1,209,000 (grt) in 1972 to 1,551,000 (grt) in 1973. Indonesia has acquired a few ships in the 100,000-dwt category, the largest being 140,000 dwt. These vessels, which were acquired on a hire-purchase basis from Europe, are on charter for a period of 10 years. Pertamina (the Indonesian national oil enterprise) will take them over at the end of that period, and thus build up its ocean tanker fleet.

New tankers being built for some of the member countries are: India — 26 (1.9 million dwt); Singapore — 37 (3.3 million dwt); Indonesia — 2 (70,000 dwt); Malaysia — 2 (57,000 dwt). Bulk and combined carriers are also being introduced in the developing fleets, principally those of India and Singapore. India has 50 bulk carriers (totalling 2.3 million dwt) on order and Singapore has 3 (totalling 120,500 dwt). There is also a small tonnage of container/semi-container ships, a substantial portion of which is owned by Singapore.

It will be seen that some of the developing member countries are making efforts to diversify their fleets, and these countries are gradually acquiring dry-cargo ships, oil tankers, bulk carriers and container ships.

Technological advances in ship design and development of unitized ships and specialized carriers have had a great impact on the development of the national merchant marines and port facilities of the developing countries. These new developments are radically reshaping both the shipping industry and the setting for its

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operations, and thereby present the developing countries with a particularly difficult dilemma. Their fleet development plans call for acquisition of ships for fleet augmentation as well as for replacement of a large number of old and uneconomic tonnage. Ironically, this coincides with the time when technological advances have made ships highly capital-intensive and shipbuilding prices have registered a marked increase. Shipping prices in general have risen sharply in the last five years from US\$261 per dead weight ton in 1969 to US\$763 in 1974, principally because of sharp increases in the cost of labour and construction materials. The price rise was most significant during the recent one-year period of June 1973 to June 1974, registering a rise of over 64 per cent.

Nearly half of the number of ships in the ESCAP developing countries' existing fleet will have exceeded their economic life by the end of this decade. In fact, about 18 per cent of the fleet tonnage is already over 20 years in age and about 15 per cent will reach this retiring age in the coming years.

Clearly, a large replacement programme will present a number of difficulties; replacing vessels of above 20 years (constituting about 1/3 of the fleet) by the end of the decade will cost about US\$2,800 million according to the shipbuilding prices per dwt ruling at the end of 1973. Of course, if second-hand vessels were used as replacements, the over-all investment would be less. On the other hand, the acquisition of a specialized carrier would cost much more than a conventional ship.

The most important issue facing the shipping industry today is the impact of technological development. In recent years, the shipping world has undergone profound structural changes and this process has by no means come to an end. Shipping operations have changed radically as a result of technological advances in ship's design and improved methods of cargo handling. While the current technological progress offers important opportunities, it poses difficult problems, particularly to the developing countries. The impact of such developments is felt in several activities by these countries as users of shipping services, as actual or potential ship owners or with regard to the provision of suitable port installation, inland transport and infrastructure adapted to such modern technology. For the development of their merchant marines, these countries are faced with difficult choices of ship types at a time when world shipping is going through a major transformation, owing to changes in trading patterns which necessitate the introduction of a variety of highly capital-intensive ships. Each type of ship is suited to a particular task or to a particular economic and physical environment. Each has particularly advantages when used in the optimum manner and corresponding disadvantages, often extremely marked, when used outside the sphere of its optimum employment.

In the case of developing countries, a number of constraints impose limitations and somewhat restrict the choice of ship types. First and foremost comes the question of being able to afford ships which are becoming increasingly capital-intensive on account of their sophisticated machinery and equipment and of the rise of shipbuilding costs in recent years.

Then there are the problems of physical characteristics of ports and their facilities, hinterland infrastructural facilities and related social problems, etc. In addition, countries have to consider questions of continuity of carriage for the break-bulk cargoes and the possibilities of unitization. The range of choices is large, e.g. (i) unitizing with the use of pallets, whether in specially adapted ships or in unadapted break-bulk liners; (ii) use of containers and the type of vessels used for their carriage; (iii) introduction of barge-carrying vessels and (iv) acquisition of composite ships which may have a roll-on/roll-off facility together with container and perhaps pallet and break-bulk cargo capacity, or which may be designed to handle different forms of unitized cargo while retaining substantial break-bulk space.

Containerization is one method of cargo unitization; others include the barge-carrying system, roll-on/roll-off system, palletization and the pre-sliding system. Containerization poses many problems and seems to have several disadvantages for developing countries, at least for the present. It involves huge capital investment in vessels, port facilities and containers. Traffic flows have to be reasonably balanced both directionally and seasonally over time — which conditions are not necessarily met on the trade routes of all countries of the ESCAP region. Other limitations include the need for infrastructural facilities and social problems; the latter occupy a position of significant importance for the developing countries.

The roll-on/roll-off (ro/ro) vessel with all its flexibility shows promise for the developing countries of ESCAP. Composite ro/ro vessels fitted with container facilities and side port operation of pallets are potentially attractive and well suited to the heterogeneity of the developing countries' trade.

Palletization would seem to provide the most feasible unit load system for most of the developing countries of the region which would face many complex issues in adapting to containerization. Ships can be adapted without making expensive demands on existing port and other infrastructural facilities. The disadvantages caused by heavy rainfall and lack of adequate transit sheds in most ESCAP developing countries could be overcome by the development of shrink-wrapping. The extent of application of palletization in the ESCAP region would differ from country to country depending on the suitability of its infrastructure. In some cases, it would lead to intermodality and perhaps door-to-door delivery; in other cases, its use might remain confined to port areas.

A development of topical interest to the ESCAP region is the emerging use of barge-carrying vessels (BCVS) pioneered by LASH (lighters aboard ship). The drastic reduction in the port time of BCVS is a major benefit of the system. Other benefits include: a through bill of lading can be supplied; cargo can be shipped from port to port or door to door, as BCVS serves both coastal and inland locations with equal efficiency; and it offers full cargo service to the shippers regardless of the type of commodity, size or weight.

However, there are some constraints in the operation of the BCVS system. The width and depth of available waterways and access to coastal ports may place restric-

tions on the operations in all water-ways. There may also be legal problems affecting the operation of barges of foreign carriers in the cabotage areas of the countries which, under national legislation, are reserved for craft registered in the country; the success of BCVS operations will depend on the solution of such problems.

The BCVS system appears attractive for use in the trade of ESCAP developing countries, particularly countries with a long coastline and numerous riverine inland ports.

With all the various methods of unitization, the question arises as to which particular form of unitization or combination thereof will best suit the developing countries within the over-all constraints of social problems; type and volume of cargoes; imbalance in imports and exports; legal problems; banking and insurance, etc. Containerization and other methods of unitization have effects on the usefulness and suitability of existing conventional vessels that have become economically non-competitive, even though they may be in excellent technical condition. Conversion of such ships to provide unit-load handling and transport would be a means of securing competitive tonnage at a relatively low cost.

The most marked trend in modern shipping is towards greater size to obtain economies of scale. However, the size of oil tankers and dry-cargo bulk carriers or combination carriers for adoption in a particular trade should be considered within the operational constraints and other limiting factors which might favour the use of smaller than optimal size vessels.

In more recent years, complementary patterns of trade using both combined ore-oil and ore-bulk-oil (OBO) ships have developed on a worldwide basis. Combined carriers seem to have proved most flexible in the charter market, in switching between oil and dry cargoes as trading conditions alter and in minimizing ballast voyages. These vessels could be employed in the grain trade, as demand for grain normally fluctuates with harvest conditions in importing countries and hence specially-constructed grain ships have less security.

Slurrying of dry-cargo materials, such as coal and iron ore, is likely to make considerable progress as it would ensure fast cargo-handling and short turn-around time, as with bulk liquids. This development involving the pumping of cargoes could radically transform the position and also provide flexibility in deciding upon locational criteria for steel plants, etc.

The development of the parcel/product tanker permitting simultaneous carriage of several kinds of liquid commodity is most suitable for the regional exports of palm oil coconut oil, molasses and rubber latex.

The most important aspect of future fleet programming for the ESCAP developing countries would seem to be the right type of vessels for the right jobs. The changes taking place in the maritime field present new perspectives for ESCAP shipping. It has to adapt itself to the changing conditions of maritime traffic. The introduction of an adequate number of tankers, bulk carriers or combination carriers, and product/parcel tankers appears to be the right way to develop regional shipping. New situations and new needs will develop with the increase in

container traffic on major shipping routes connecting the developing countries of ESCAP. The ESCAP fleet should be poised to meet the demands of feeder services. The presence of a large percentage of ships requiring replacement by 1980 is an advantage to the developing countries in that it will enable them to diversify the composition of the fleet through replacement by more suitable vessels, such as tankers, bulk carriers, parcel/product tankers, short-sea container ships, roll-on/roll-off vessels. There will still be a role for the conventional break-bulk ships in the foreseeable future. Ships in the ESCAP fleet that have 10 or more years of economic life may be considered for conversion to handle unitized cargo, particularly pallets, which will come more and more into use in the trade of developing countries.

The main difficulties facing the developing member countries in acquiring additional tonnage are lack of financial resources, scarcity of foreign exchange, absence of a strong capital market and lack of ship-building facilities. The situation has been further aggravated by the hardening of shipbuilding credit terms by the OECD countries.

The possibility of concerted action as a co-operative project would be of great help in overcoming many such difficulties that are being experienced. A multinational shipping enterprise, a joint venture in shipping or a pooling of shipping resources has several distinct advantages and benefits. It provides for sharing of capital, spreading the risks more widely, optimizing utilization of shipping capacity, availability of cargoes from a wider area, and a greater choice in recruiting trained manpower. A multinational approach in a suitable project would not only increase its profitability but would strengthen its competitive position in the shipping market and would enable it to expand its services and achieve increasing economies from a larger scale of operation. The multinational shipping enterprise may be confined to the regional interests or extended to include the participation of a developed maritime country. In the latter case, there are many advantages and benefits, and some of the problems and constraints that may be impediments in starting and successfully operating joint ventures confined to the interests of the developing countries are eased considerably. Co-operation in shipping ventures could take several forms and be considered in a wide spectrum. This calls for necessary cost/benefit analysis and in-depth studies of all relevant factors: present situation in shipping resources, future needs and prospects, and the legal, financial, technical and operational aspects, in order to determine the most suitable type and form of joint venture in shipping by two or more developing countries of the region, whether confined to regional interests or in participation with a developed maritime country. Ships themselves constitute only one component of the maritime industry.

The maritime evolution has brought out three broad categories of shipping service; liner, tramp and industrial. These are not, however, sharply defined or mutually exclusive. What distinguishes the liner companies from tramp companies is that the former advertise a scheduled service between specified ports whereas the latter do not.

The liner services are faster and use more costly vessels. They have an extensive network of cargo solicitors and agents and handle a wide variety of more highly valued cargoes from a larger number of exporters. However, the liner companies also bid for bulk cargoes in direct competition with tramps. The tramp companies are potentially more flexible instruments of shipping. They compete with both liners and bulk carriers for their cargoes. With the developments in containerization it remains to be seen whether more cargoes will be available for tramps. It has to be seen whether containerization will absorb commodities such as copra, fertilizer and wool. Tramp companies operate with smaller overheads than liner companies and, having no commitment to maintaining a regular service, enjoy greater flexibility in the use of their ships. It is easier for tramp operators to lay up tonnage in critical periods, which could not profitably be employed without excessive costs.

With capital costs being relatively smaller in tramping than in liner shipping, owners must be more concerned about means for stabilizing income, hence the tendency towards time in lieu of voyage charters and towards advance contracts for freighting services in the bulk carrier component of industry.

Recent press reports suggest that, because of the present depressed tanker market, the tanker owners are willing to pay charterers for time-charter deals as an alternative to sending their vessels to lay up. In one widely reported case, American charterers have concluded a deal in which they have time chartered a VLCC of over 200,000 tons for six months, with delivery in the Mediterranean and re-delivery in the Gulf states area, and, for this privilege, the owners are paying the charterer about 21 US cents per dwt per month (equivalent to about US\$250,000).

The maritime technological developments and innovations in the nineteenth century, resulting in the introduction of steamships and the opening of the Suez Canal, were largely responsible for the initiation of the liner conference system. The system had its origin in the trade with Asia when, in 1875, the shipowners operating on the Calcutta/UK route formed an association known as the Calcutta Conference. The main motivation for forming the Calcutta Conference was to control and safeguard against unhealthy competition among the various shipowners operating in the same trade. This motivation continues to the present day in respect of approximately 360 conferences operating on various routes.

The word 'conference' does not imply that the scope of operations and the standing arrangements are the same in all shipping conferences. However, there is one common feature found in every conference and that relates to agreement among the member lines to charge a uniform rate of freight for at least the main cargoes moving on a specific route.

In nearly all liner trades the general pattern of operations has evolved as a result of individual activities of different liner operators, each seeking to satisfy the needs of his own shippers. While individual operators have a long history of co-operation in maintaining freight rates,

until recently there has been little co-operation in regard to operations. As a result, the prevailing over-all pattern in many liner trades appears to be characterized by over-tonnaging and duplication. However, over-tonnaging can be assessed only in relation to a total trade of a group of countries which comprise a loading area. There is need for rationalization of liner services, involving the introduction of co-ordinated scheduling among carriers, to concentrate the port-to-port cargo movements into a reduced number of sailings.

There has been growing concern among the developing countries about the shipping services provided by the liner conferences. While the admission of new members into the 'open conference' does not present any difficulty provided that the required qualifications are fulfilled, membership of a 'closed conference' is most difficult, being subject to the agreement, often unanimous, of all the existing member lines. A new entrant's initial and subsequent percentage share of participation is also subject to agreement among the members. As you are aware, in 1974 a convention on a code of conduct for liner conferences was adopted under the aegis of the United Nations. This convention will enter into force six months after the date on which not less than 24 countries whose combined tonnage amounts to at least 25 per cent of the world tonnage have become contracting parties to it.

However, the development in containerization of cargoes and container traffic will have profound effects on the conference system since the circumstances in which it operates will themselves change. The developments will inevitably lead to world trade being served by fewer organizations, replacing a large number of existing conferences, at least on the major shipping routes. The important result of a change of this magnitude will be the concentration of potential monopoly power in the hands of a smaller number of consortia operators. In future, it seems that operators of such services although in a position to provide a greatly improved service to shippers, will inevitably have a greater potential monopoly power than is now available to conventional liner operators organized into conferences. In general, the degree of real choice available to most shippers will diminish. This change will not result from any sinister intention on the part of the operators, but will arise out of their seeking efficiency of organization in the light of developing technology. It is also significant that the increased monopoly potential could also extend to the land leg of multimodal transport system.

Multimodal transport or intermodal transport (the terms are interchangeable) occurs when an operator undertakes the full responsibility for the transport of the users' goods from the place of origin or acceptance in one country to the place of final destination or delivery in another country by two or more modes of transport. In the absence of a multimodal transport operator, the user would require separate contracts for each mode of transport. However the MTO will be able to meet any liability for loss or damage to the user's goods through his own fault or that of his subcontractor. The MTO would also be able to provide or procure the transport required

by each leg of the total journey and to control and co-ordinate each leg or mode of transport to ensure the efficient transfer from one to the other.

Certain important technical problems arise from the use of multimodal transport, mainly as a result of the users not having separate contracts for each stage of the through transport journey. In addition to an overlapping of technical problems, there are policy matters of special concern to developing countries. The main technical problems are: liability and insurance. The existing international conventions set different conditions and limitations on the liability of carriers depending on the transport employed (CIM, CMIR conventions, the Hague rule). Then there would be the question of documentation. The status of documents issued by MTO in place of the traditional bill of lading and carrier's receipt and their negotiability and acceptability to banks present special problems. Thirdly, existing practices in some countries are at variance with the concept of through transport and have to be in line with the changing traffic conditions.

On the policy side many developing countries are concerned at the way in which the activities of the MTO are likely to affect: the ownership of sections of their inland transport industry; development of indigenous insurance business; terms of trade (since such traditional terms as c.i.f. and f.o.b. are not appropriate to the through transport system); currency of payment — a through rate system of charging may adversely affect the balance of payment of the countries.

Bearing in mind the close connexion between multimodal transport and container operations, there are consequences for ports and port handling and also employment prospects.

The United Nations Economic and Social Council established an intergovernmental preparatory group (IPG), under the auspices of UNCTAD, to elaborate a preliminary draft convention on international intermodal transport. The UNCTAD secretariat, in co-operation with the appropriate regional bodies including ESCAP, has prepared studies which cover all the relevant aspects of the international combined transport of goods, including such matters as repercussion in the fields of international trade and transport, balance of payments, cost of international transport, insurance, and consistency of the international combined transport of goods with national policies on transport, trade and insurance. These studies have taken the needs and requirements of developing countries into particular account.

IMCO has been engaged in achieving the highest practicable uniform standards of maritime safety and efficiency of navigation. A number of international conventions have been adopted and are in force.

With the increase in the volume of world trade, bulk shipping has also been increasing considerably. As a consequence, the density of maritime traffic in narrow waterways, straits and channels has increased and is likely to increase further with the growing world shipping tonnage. Moreover, ships have become much larger and deep-draughted. Hence the importance of the traffic separation schemes established in certain areas of congested or converging traffic, in order to minimize risks of

collision and grounding and the attendant risk of pollution of sea, coastlines and beaches. The introduction of a traffic scheme in the Strait of Malacca has been particularly important as the volume of traffic is expected to approach that of the Strait of Dover and might well even exceed that of the Strait of Gibraltar. The recent catastrophe of the super tanker *Shawa Maru* clearly brings out the importance of the traffic separation scheme. However, in considering the financial effect of such a scheme in the Strait of Malacca, the question arises whether the capital and recurring costs of navigational aids, radio broadcast facilities and surveillance, which would mostly be used by maritime traffic only transiting throughout the Strait, should not be the sole burden on the countries providing them, but be shared by the users as main beneficiaries.

Now a word about ports. Most ports in the developing ESCAP region can trace their *raison d'être* to the specific economic requirements of the colonial era. The accelerated pace of economic development, coupled with the rapid advance of technology in ship design and cargo-handling methods, have placed new demands on the ports of the developing member countries. In some countries, construction of entirely new ports has become necessary. All these tasks have had to be performed, subject to such serious constraints as lack of adequate funds and lack of the management and operating skills needed for current and future operations of ports, many of which will change from being terminals to being interfaces between land and sea transport. Gradual initiation in modern techniques of management, planning and port development operations is unavoidable.

While the ports of developing countries might be subject to pressure for new facilities, the specifically different environmental factors would have to be taken into account. These factors vary from region to region, country to country and port to port, but they might well mean that port improvement would have to be considered in the context of different objectives or at least of different orders of priority. The whole question of objectives is thus of central importance. It is particularly important for developing countries to consider possible alternatives to projects necessitating capital investment; much could be achieved not only by operational improvement, but also perhaps by changes in port tariffs and charges and by finding low capital cost solutions to port problems.

While the nature of port problems is similar in most ports of the developing countries, the means and methods of achieving the required goals vary from country to country, depending on a wide range of factors. However, the common needs of all these countries are: long-range planning; financial considerations; planning for handling unitized ships, specialized ships and their cargoes (e.g. grains, timber, logs and ore); improving navigable channels and water depths; and improving the efficiency of port management, administration and operation. Slow customs procedures continue to be a major obstacle to a quick cargo throughout at many ports, with consequent congested conditions of port storage and delays in ship departure. They also demand forecasts — for the

reasonably foreseeable future — of the type of ship and the volume and nature of cargo to be handled. The collection and analysis of port statistics as tools for management and planning has become most important. The secretariat has developed a methodology for establishing a set of primary port performance indicators and hopes to complete, by the end of 1975, a pilot study for testing the effectiveness of the methodology in three typical ports of the region.

It is also necessary to rationalize the structure of port tariffs in ESCAP member countries as elsewhere in the world. The age-old practice of assessing dues according to a ship's carrying capacity does not meet the needs of current shipping practice. This practice was acceptable when all vessels tended to have similar cargoes. Today, however, vessels tend to be specialized in function,

carrying specific cargoes (refrigerated goods, liquid chemicals, liquefied gases, timber, etc.) and using specific methods of handling cargoes (containers, roll-on/roll-off, pallets, barge carriers). Port charges need to be more closely related to the demands made on port facilities by each type of ship. There are some types of vessel which use part of the facilities offered by ports, such as tankers, bulk carriers and barge-carrying vessels. Container vessels, roll-on/roll-off ships, grain carriers and very deep draught tankers make specific demands on port facilities and use specialized port installations. In addition, the current practice of using net tonnage for assessing port dues bears no relation to the vessels' length and draught in terms of individual items of port expenditure. The classification of ships into a number of types to provide a realistic basis for calculating port charges is becoming necessary.

TECHNOLOGICAL PROGRESS IN SHIPPING*

The purpose of any technological progress is to achieve one of the following three objectives: (a) to produce the same output using fewer of at least one input and no more of the others; (b) to achieve the same output by substitution between inputs so that more of a relatively less costly input and less of a relatively more costly input is used; or (c) using the same inputs, or a different mix of inputs having the same cost, to produce an output of superior quality.

In practice, we usually find that any technological change is mixed in its effects and has results covered by two of the objectives. Normally, there will be a primary objective and the other is a secondary objective, or even simply a "spin off" which was no part of the original ideas of the innovator of the technological change. Thus, for instance, the use of containers substitutes capital for labour but at the same time produces, or it is said, a superior service. It cannot be overlooked ever that a technological change may come into effect which substitutes relatively less expensive inputs for relatively more expensive ones but actually increases costs. Then the justification for making the change can only come through "spin off", that is, the eventual product is, or is claimed to be, superior. This is of course fine if the user or consumer wanted a superior product but not fine if he was perfectly satisfied with the product he was getting.

This last point is of particular relevance for developing countries and enables us to look at technological development in shipping as having two effects so far as developing countries are concerned. There is, first, the effect arising from the fact that the technological development has occurred in countries with different relative prices of labour and capital than is the case in developed countries and, second, the improved standards of service, for example greater speed, may be important in developed countries but not for shippers in developing countries.

The problem with technological development in shipping is rather more complex than that in most industries. In industry it is simply the product or output which counts and the manner in which that has been achieved is irrelevant to the user. Of course, the manner in which it is achieved may influence the nature of the product or its price, in which case it is not irrelevant to the user, but, so long as a homogeneous product can be produced and sold at the same price by any one of a number of different technologies, the actual one used is irrelevant to the consumer. In the case of shipping, however, the product of shipping, namely ton/miles of carriage, cannot be bought alone, but has to be bought in association with services bought in the ports at which goods are transferred from other transport modes to shipping which renders the product really wanted, namely, ton/miles of ocean carriage. Insofar as the technology of shipping affects the technology of the ports,

the user of the shipping services is not indifferent to the technology because, while the ton/mile cost to him may be the same for different shipping technologies operating under different relative cost levels, the handling costs in the ports are likely to be quite different for different shipping technologies.

The fact that shipping services have to be purchased in association with port services has a number of important repercussions, not least on the choice of ship to trade between ports with different cost levels. The ideal of course would be a ship which could be worked in a most highly mechanized fashion with the absolute minimum of labour when it was loading or discharging in a developed country and then worked with a minimum of capital and a great deal of labour when it was loading or discharging in a developing country. In some circumstances, the use of barge-carrying vessels may not give a very good result in this type of situation, even if they do meet the condition of the ideal. This will apply so long as the job of filling the barges can be carried out at the point in the distribution chain where methods are always fairly labour-using, whatever the country. This is generally at the point at which a total journey commences and thus implies that, for locations on navigable waterways in developed countries, the barges of a barge-carrying vessel can be worked using the technology which would have been used to load a container or a lorry. Then the barges are towed to the mothership where they use a most sophisticated technology for stowage into the ship and for the ocean transport. At the destination in a developing country, the barges can be off-loaded and on-loaded by conventional means in the port and there is no need to worry about taking barges inland — although that may be done if the inland waterways exist. The number of trades which can be connected to inland navigable waterways in developed countries is inevitably limited and so the barge-carrying vessel cannot provide a universal solution to the problem of conflicts of economic technology at different ends of a route.

The intermediate technologies also have some useful characteristics in this connexion. For example, the use of pallets in ships with sideport and discharging and lift-on/lift-off loading enables many of the advantages of mechanical handling to be achieved without the capital investment involved in full container operations. In ports in developed countries, the handling of pallets will always be somewhat more expensive than the handling of containers, provided throughput of containers is sufficient to permit somewhere near full operation of equipment. However, at many ports in developing countries, the use of containers is unlikely to be economic in the foreseeable future because of the throughput factor, and the use of an intermediate technology achieves significant economies over break-bulk and thus produces significant savings in total transport cost.

One important point which must never be overlooked is the question of the size of ships. It is of course true that the costs per ton/mile of small ships are higher

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than the costs per ton/mile of large ships. The position may be different with cargo-handling costs, and certainly with break-bulk ships the increase in cargo-handling costs as ships increase in size has set a limit to the size of cargo liners. In bulk trades, the development of improved cargo-handling equipment, e.g. pumps, was essential for the size revolution to occur. While ton/mile costs are lower with fully-loaded big ships than with small ships, the cost per ton/mile of cargo carried by a fully-laden small ship is significantly smaller than the cost per ton/mile of a large ship which is practically empty. For many reasons, including the institutional ones of conference organization, trades which are logically small ship trades have come to be served as wayport trades by big ships which are too big to be able to fill up on their main trades. With technological development, the ships have got bigger and, particularly with the advent of container ships, there has been a dramatic increase in the size of general cargo carriers. This increase in size has simply increased the problem of the ships in small ship trades being too big. Thus, any country in coming to terms with technological progress should consider how far technological progress can meet their needs by making small ships more economical.

The problem with small ships used to be their excessive manning in relation to the volume of cargo carried, but, with modern construction, methods and modern navigational devices, this problem can be met. One can thus envisage that technological progress may lead to sensible solutions, such as a return to the use of cargo liners of around three or four thousand tons deadweight in the trades between developing countries, and even in trades between developing and developed countries provided the ships are fully equipped for handling pallets by mechanical means in the hold. There are also small container ships which can be used for feeder services. One could envisage a coastal or regional service in the developing world using either small container ships or fairly small composite ships which was performing the dual function of collecting containers for assembling at a central point for despatch to developed countries, distributing the containers which had arrived and handling coastal and regional trade in palletized or break-bulk forms.

Perhaps only a ship with roll-on/roll-off capabilities can have the necessary flexibility. Such types can be loaded with virtually anything than can walk or roll, and so would be particularly suitable, especially if they had some lift-on/lift-off capacity, for the type of operation which we have envisaged. They are particularly relevant for shot-sea services, but the fact that they are used in ocean services is a sign of their true versatility.

It is not possible to make any general statements about what will be, and what will not be, economic for different types of trades. Every trade or every country's trade has to be examined individually in order to determine which technology or mix of technologies out of the range of technologies now available is the one which is most appropriate for that country. Much damage has been done by the number of studies which have been made of container operations, barge-carrying vessel

operations and so on, purporting to show certain ton/mile costs irrespective of the trade mix and volume and the port facilities. Most of these studies have in some way or other been inspired by the producers of the equipment which is to be sold and have presented highly optimistic forecasts. Obviously, before there was any experience of the technologies in service, estimates had to be relied upon, but these estimates have to be used in conjunction with an intimate knowledge of the trades in which it is proposed to use the equipment.

One important point for everyone to consider in looking at the costs of new technologies is the fact that the technology may cause costs to shift, or, while saving costs in one area, it may be imposing new costs in another. In the case of container operations, for example, the cost of stowing individual packages is removed from the port to the depot where the containers are stowed. In the case of large tankers, other bulk carriers costs in transport are saved, but ports are subjected to heavy costs in dredging and providing mooring facilities and the right type of loading and unloading equipment to ensure that the economies of transport gained by the ships are not counterbalanced by diseconomies in port. Thus, it is never sufficient to look at the effect of any technological development in shipping from the point of view of ton/mile costs alone. It always has to be looked at in terms of the total transport costs, since it is only by seeing the effect on the total transport cost that it can be seen whether the innovation is really cost-saving.

Apart from the question of what the effect of a new technology has been upon total transport costs, there is the question of the extent to which any cost savings which may have occurred are, or are not, reflected in the prices charged by the carriers concerned. This is a complex question because it requires identification of the cost savings involved and then the relation of these to the freight charges.

Taking the identification question first. New technologies are usually more capital-intensive than those they replace: indeed the increase in capital intensity is usually the *raison d'être* for the introduction of the new technology. Thus, the costs related to capital rise as a proportion of total costs: specifically, depreciation or the amortization of the asset cost becomes a much more important element of costs than formerly. Hence, the arrangements regarding depreciation have a critical influence on the level of costs. This is the hardest of all items on which to judge the appropriateness of the level adopted, since the expected length of life presumed for the asset is based on subjective rather than objective criteria.

In dealing with established technologies and trades, one may use the experience of the past as some guide to the future, although this is far from guaranteeing that the decision so taken will subsequently prove to have been correct. In dealing with new ventures, even this tenuous link with objectivity is lost. Given the high cost of, for example, a cellular container ship, it can make a significant difference to the apparent level of annual costs whether the shipowner decides to depreciate it over say eight years or ten years. Yet it is nearly impossible for anyone to argue that one can sensibly judge between eight

years and ten years as the correct expectation of economic life. All that can be said is that shipowners, taking a cautious view, will almost certainly try to write off their ships in their accounts several years before they really expect them to be scrapped. This has the result of understating the cost savings produced by the use of the new technology. What has then happened is that the costs of the risk involved in the innovation, which the shipowner introduced for his own purposes, have been transferred to the user of the vessel irrespective of whether or not he wanted the change.

As an aside at this point, it may be noted that, if the owners of container ships may have understated the savings obtained over conventional break-bulk ships by exaggerating the speed of their economic obsolescence, the investors in port installations appear to have done just the opposite. There, in order to justify investments more or less forced on them by the actions of shipowners combined with competitive pressures from other ports, quite unrealistically long lives have been assumed for much equipment.

A further factor to be considered is that the position with regard to loads which are less than those required to fill a container is different from that for full container loads. The multimodal transport operator grants a rebate for full container loads, thus recognizing that the costs of stuffing and stripping the container have been shifted to the shipper. Where smaller shipments are concerned, the operator offers a groupage service and so undertakes cost-creating activities himself.

Assuming that the cost savings have been correctly identified, how are these to be related to freight charges? This can be looked at in terms of the total costs to be incurred per annum in the operation of the new services, which can then be related to a level of freight rates which will cover those costs and leave the carrier with a reasonable profit. This, in itself, involves assumptions about the expected volume of cargo and the expected mix

of cargo, both areas of subjective judgement. Alternatively, the cost savings may be looked at in terms of a percentage change from the previous level, which percentage would indicate the freight rate reduction to be granted. The problem here is that the comparison is between past and future cost levels. This comparison may reasonably be made when similar technologies are being compared in a period of changing costs, or where different technologies are compared in a period of stable costs. However, in the case we are considering the comparison has to be made between different technologies in a period of changing costs. As a result, the consequence of the new technology may be to prevent a change in costs which would otherwise have occurred, something more difficult to establish than an expected change.

It is clear that the question of shifting costs is complex. The very complexity of the questions, and the extent to which judgements regarding them are based on subjectively determined expectations, not on objectively determined facts, enables the issues to be readily confused and requires those who have to take decisions to dig deeply and expertly into all available information if the decisions are to be made on a rational basis.

The whole question of technological change is fraught with problems. It is easy, but wrong, to see that the solution is simply to resist change. However, technological change is inevitable and, while the whole world might resist it or individuals and single countries might resist any individual example of such change, over all they have to find ways of obtaining the undoubted advantages which changes offer, while ensuring that any adverse consequences are minimal. All change hurts: the objective must be to control the pace at which change is accepted so that the hurt is objectively less than the benefit. For this there is no substitute for knowledge and understanding, and, in each country, one urgent function of a shipping investigation unit must be to examine the condition of proposed technological changes and how to come to terms, if at all, with particular changes.

SHIPPING NEEDS OF DEVELOPING COUNTRIES*

Shipping is important to developing countries because, in the vast majority of cases, their import and export trades are seaborne. Shipping as the carrier of trade is certainly its most important aspect. A second aspect is shipping as an industry encouraged as part of the economic development of the country.

There is a tendency to look only at the second of these two aspects and to give it predominance. This tendency is reinforced by the fact that, within Governments, shipping policy is usually handled by ministries of transport and is the policy concerned with the shipping industry. The role of shipping in relation to trade tends to be very much neglected.

Within these two broad aspects there are a number of sub-aspects. These may be considered to cover the following:

1. Protection of the interests of shippers;
2. Priorities for shipping development;
3. Finance for ship acquisition;
4. Maritime legislation;
5. Development of ports.

We will consider each of these in turn.

1. Protection of the interests of shippers

The interests of shippers are to have their goods transported from point of origin to point of market safely, expeditiously and as economically as possible and that the facilities to do this should be available with the required frequency. Thus, their over-all interest has a number of facets, no one of which is more important than the others, although most discussion of shipper interests does tend to concentrate on the question of freight rates. Their requirements are met by the providers of transport.

Why should the interests of shippers need protecting? At first sight it would seem that the carrier seeking the custom of the shipper in order to employ his vehicles or vessels will endeavour to provide a service which has just those attributes which the shipper requires. The price would be settled by a bargain between shipper and carrier and it might appear that there was no need to go any further into the matter. In some transport relationships this position appears to exist and the two parties to the transport contract can fairly comfortably be left to get on with their arrangements in the knowledge that there is no great imbalance between them which could jeopardize the interests of either.

It is when we look at the market for liner shipping services that the problems of a disparity of strength between shipper and carrier are seen. In any one port there may well be several thousand shippers, but connecting that port with each overseas port there may be no more than three or four shipping lines. Thus, even without any institutional factors intervening to alter the relationship between shipper and carrier, the very fact of

a large number of shippers facing a small number of carriers means that the carriers are always in the stronger bargaining position. This bargaining strength has been increased because institutional factors have supervened, namely, through the creation of liner conferences.

In this situation, the relative strengths of the two sides can apparently be brought more nearly into balance if the shippers can organize themselves so that, in place of several hundred shippers facing a single conference, one single body representing the shippers can face the conference. This would appear to create equality of bargaining strength. In practice, real equality is unlikely ever to be achieved. The shipper, or group of shippers, with alternative markets to which he can easily divert his product will have a strong position vis-à-vis the shipping lines, certainly stronger than those shippers who are dependent on a single market. Shippers who command large cargo volumes may even be in a stronger position than the shipowners, since the shipowners will be largely dependent on those shippers for the continuation of their shipping activities. Without multiplying the examples, it can surely be seen that there are a large number of different situations, possibly in none of which is bargaining strength ever equal, and that absolute equality is a will-of-the-wisp not worth seeking. What needs to be sought is a sufficient balance of interests.

What is at stake is not only the livelihood of the individual shipper but the whole foreign trade of the country or countries concerned. The more difficulties a country possesses in obtaining access to markets, the weaker is its over-all economic position, and the more vital it is that the shipping services serve as well as is humanly possible the interests of the shippers. Apart altogether from questions of relative bargaining strengths, the interests of the shippers may fail to be served because the carriers, if they are foreign-based, may be ignorant of the precise needs. Furthermore, while each of the carriers may be efficient, inefficiencies are likely to be created through the institutional arrangement of the conference. The whole history of cartel-type organizations is one of inefficiency.

Behind the organization of shippers must lie a body which is providing shippers with the information they need so that they can genuinely bargain with the carriers or the conferences. This information must cover not merely all those factors related to the level of freight rates which the export products can sustain in reaching the market, but also an understanding of the inefficiencies created by the conference organization and how to remedy those inefficiencies. The history of one hundred years has shown that conferences do not remedy their own inefficiencies and that, if overlapping sailings, over-tonnaging and other practices which raise costs and/or lower standards of service are to be eliminated, the initiative has to come from the users of the services.

This leads to the statement of an important principle which is not unique to shipper/shipowner relationships but in fact exists in all bargaining situations.

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However united shippers may be, however much knowledge they may have, their bargaining strength is ultimately a question of the alternatives open to them. If the shipowners know that the shippers have no other possibilities of getting their goods carried to market, the shipowners have the whip-hand. If, however, the shipowners know that if negotiations with the shippers break down the shippers can utilize alternative transport, they no longer have the whip-hand in the bargaining.

What is clear is that conventional consultation procedures between shippers' councils and liner conferences will not protect the interests of shippers unless those shippers are themselves already possessed of considerable bargaining strength because of the size of their own operations. In developing countries, where the typical shipper is small and where very frequently he is not indigenous but a subsidiary of an overseas firm, relying on what may be called the European pattern has proved to be completely inadequate to protect the interests of shippers. Experience has shown that, while it is necessary for shippers to organize themselves into shippers' councils in order to confront the conferences with a single voice, this on its own is not enough. Indeed, as has been suggested above, a single voice which does not have the knowledge to know what it should be saying is basically no better than one hundred voices all saying different things. Thus, behind the shippers' council must lie a shipping investigation unit.

The shipping investigation unit must not be concerned merely with trying to present shippers with ammunition for straightforward freight rate bargaining. It must devote the major part of its attention to those elements which generate costs in liner shipping in order to attack the problem of freight rates from the side where there is the most chance of progress. It must never be forgotten that the provision of shipping services inevitably entails costs, just as does any other economic activity. Although shipping conferences undoubtedly possess a degree of monopoly, there is no clear evidence that liner companies earn monopoly profits; indeed, they themselves argue that they earn very low rates of profit. However, just as there is no evidence which shows clearly that they earn monopoly profits so the evidence that they earn inadequate profits is equally suspect. What is clear beyond any question is that they do incur excessive costs because the organizational structure of the conference is one calculated to produce excessive costs. Normal competitive pressures, which might in other circumstances lead to excessive costs being eliminated, are set aside by the system, and so it becomes incumbent on the users of the services to investigate the cost questions themselves.

2. Priorities for shipping development

Despite public statements, developing countries in their allocation of resources have not generally given a high priority to the development of shipping when drawing up industrial development plans. There may be a number of reasons why this is so. These include the unfavourable capital income ratio, the unfavourable capital employment ratio, the riskiness of shipping, lack of

technical knowledge, lack of trained manpower and finally that, within Governments, the Minister for Transport is often a junior minister and does not have the same push when budgetary allocations and planning decisions are made as more senior ministers.

Taking the question of the ratios first, there is considerable misunderstanding on this fact. It is true that, if the cost of a new ship is compared with its direct employment creation, it would appear that a country could create more employment in other ways than shipping. There are two relevant observations on this however. The first is that the capital employment ratio, or indeed any ratio involving capital, should only take account of the "free" capital involved, i.e. the capital which has an opportunity cost. If capital is available only for shipping and if not used for shipping cannot be used in other places, the relevant ratio is the ratio of the free capital to the employment or income creation and not the ratio of the total capital. Shipping, unless it is coastal shipping, is immediately earning or saving foreign exchange, and, so long as the foreign exchange inflow does not fall short of the foreign exchange outflow in debt service, the only relevant ratio is that of the free capital involved in purchase to the employment or income creation.

Once the question is looked at realistically like this, capital employment and capital income ratios in shipping are found to be immensely improved compared with those in other activities unless specific sources of capital are also used in those other activities. This is rare, however, and usually all of the capital used, e.g. in agriculture or industry, has alternative uses. It is generally only in shipping and in certain areas of mineral exploitation that the capital is unavailable unless used for the purpose, and hence only the down payment which needs to be made is relevant for the calculations of the developing country.

Another aspect which is sometimes overlooked is that, in shipping, it is not only direct employment creation in the sense of the crews of the ships which is important. Shipping needs a back-up staff on shore, and the employment created in this way also needs to be taken into account. This employment creation is different according to the different types of ships; for example, a liner service needs much more back-up staff than a bulk carrier operation.

A specific point regarding the foreign exchange earnings of shipping needs to be underlined. Ships start earning or saving foreign exchange as soon as they are placed into service. There is no gestation period and there is no leakage into domestic activities. An industrial investment, for example, may result in an increased product and improved standards for the population but in no increased exports. This is not the case in shipping.

The questions of technical skill and trained manpower are important ones. Much of the manpower required in shipping needs extensive training and this need may determine that the build-up of a shipping fleet can only be fairly slow. It is also highly relevant that, in most countries, there is a considerable wastage of personnel from shipping to other activities since seafaring is something which young men seem to find attractive for a few years and then to wish to leave if alternative employment

opportunities are available on shore. Now, for most of the critical personnel in shipping, such alternative employment opportunities may be even more available in developing countries than in developed. For example, in a situation where all engineers are in short supply, a qualified marine engineer can always find a good job ashore. The capacities required by deck officers on ships are partly technical but very largely managerial and, in developing countries where there is a shortage of management skills, they have an obvious market value. It is an economic question as to whether training manpower in shipping to serve a period of perhaps five or ten years and then to go to a less specific job on shore is worth-while or not. Certainly the fact that seagoing manpower has a shore value has to be set against the apparent loss by their early retirement from seagoing.

Developing countries as a whole have tended to concentrate on liner shipping and to ignore other types of shipping. In doing this, they have acted properly in accordance with their own capacities. Entry into liner shipping involves less risks than entry into charter shipping because of the assured market which conference membership gives. However, a continuing traffic in some bulk commodity, whether as an import or as an export, provides possibilities for low-risk entry of ships into the long-term charter market. The argument sometimes heard that the risks in shipping are too high to make it a good proposition for developing countries cannot be sustained by looking at the evidence. Risks in shipping (even in the spot market) do not appear to be any greater than risks in other enterprises with this exception: in shipping slumps, freight rates fall a very long way and operations become very unprofitable, but the slumps are generally very short-lived and so the storm to be weathered by the operator is bad but short.

The employment created by liner shipping is greater because of the greater shore staff needed. The management skills required in liner shipping appear to be lower than those required in other forms of shipping. This point must not be misunderstood. Liner shipping requires much more management as such than an operation in which ships are let out on the charter market. The point is that liner shipping requires hundreds of small-scale decisions each day, consequences of error in which are equally small-scale. A large management staff is therefore required, but none of it need be very high-powered. To operate ships in the charter market requires a very small management staff since relatively few decisions have to be taken. However, the consequences of error in each decision are relatively large. Hence, in a situation in which top-level management is spread thinly on the ground but where the general level of literacy might be fairly high, liner shipping was an obvious choice. Today, however, the extent to which expansion in liner shipping can be pushed has been virtually reached by most countries. Some still have something in hand if they are to realize the potential offered by the cargo-sharing provisions of the Code of Conduct, but, for most, the limit has either been reached or is very close and further expansion requires entry into other types of shipping.

3. Finance for ship acquisition

This in itself should be regarded as part of the previous topic, but it has assumed such importance that it is worth considering separately. However, the most important point which needs to be made has already been made, namely that finance in world markets for ship purchase is generally tied finance and, if not used to buy ships, cannot be used for other purposes.

The mass expansion of shipping which has occurred since the Second World War has been virtually entirely financed by borrowing in international financial centres. shipowners and potential shipowners, in association with lenders and potential lenders, have constantly devised new financial packages to meet the particular needs of the times and the particular involvement of capital. The means which have been used by so many European owners, many of whom were unknown in the world of shipping before their first purchase, are also available to developing countries. There are certain prerequisites however.

The first prerequisite is maritime legislation which makes it absolutely clear what the rights of a lender are in the event of failure by the borrower to maintain service payments on his debt. This clarity may be given by a well drawn up maritime code or by an established set of precedents. Lack of this clarity is an absolute inhibition to fleet development through credit since lenders will not lend on anything like acceptable terms unless they are assured that, in the event of failure, they will be able to take appropriate action to maintain the security of their loans.

A second prerequisite is the freedom of the borrower to pledge the earning stream of foreign exchange from the ship that is the subject of the loan to the service of the debt. If those earnings have to be paid into a central bank, the lender will require assurances from the central bank that nothing will be done to interrupt the transfer of those earnings in service of the loan. One then enters the area in which the reputation of the Government and the central bank become factors taken into account in concluding a lending transaction.

One factor which is not usually appreciated is that the OECD credit terms represent concessional suppliers' credit made available by OECD countries to assist their shipbuilding industries. While suppliers' credit may not be as good as buyers' credit, no source of funds should be overlooked. The OECD terms of course fall short of the terms desired by developing countries in resolution 70 (III), but they are considerably more liberal than terms currently available in international markets and a great deal more simple than the complex arrangements now made regarding roll-over loans, balloon repayments and so on.

4. Maritime legislation

There are several aspects of maritime legislation in addition to the one which was mentioned above. A legislative base is needed not only for the possibilities of developing shipping but also for the protection of shippers

and port authorities. This is not the place in which to enlarge on the questions which need to be covered by shipping legislation but merely to note that shipping in the service of trade and shipping as an aspect of industrialization do need a proper legislative framework if the functions are to be served effectively. Countries must for example be able to deny substandard ships the right to carry their trade. Just as they must give to foreign lenders the right to seize a national ship for unpaid debts, so they must have the right to seize a foreign ship in their ports if that ship has breached the laws of the country, has caused environmental damage by pollution or has incurred debts which have remained unpaid. The shipowner who does not pay compensation for loss of cargo for which he is responsible will escape without sanctions if the country of the shipper does not have an appropriate legislation enabling it to distrain on any ships of that shipowner.

5. Development of ports

Although it is a truism that all sea journeys begin and end in a port, it is a highly important truism, and it is far too often overlooked that trade cannot be efficiently and economically carried if the ports through which it is handled are inefficient and high cost. Ports must be adapted to the needs of the trade and of the ships carrying that trade, they must be able to handle goods efficiently, quickly and cheaply since the costs of handling in ports are, in the case of exports, either added to the

landed price (reducing their competitiveness in overseas markets) or deducted from the f.o.b. price (reducing producers receipts) and, in the case of imports, added to the landed price (increasing the cost of living and reducing the demand for domestic production in the country concerned). No good consequences flow from the incurrence of excessive costs in ports. However, bad consequences in the shape of congestion surcharges are common and may add anything from 10 to 50 per cent to freight costs. As bad management is the most common cause of such surcharges, improved port management is one way of reducing a country's freight bill.

6. Concluding remarks

The shipping needs of developing countries should lie behind the shipping policies adopted by those countries. Such shipping policies need to embrace all the aspects which have been considered above. They are all interrelated and all directed towards ensuring that shipping serves the needs of trade and that, where shipping is an aspect of industrialization, it can be efficient and economical. In conclusion, however, it must be emphasized that, to all countries, trade is more important than shipping, so that the questions relating to the role of shipping in serving trade are much more important than the questions relating to shipping as an economic activity in its own right.

TRAMPING OPERATIONS AND OPERATIONS OF TANKERS, BULK CARRIERS AND OTHER SPECIALIZED VESSELS*

The name tramp, applied to a vessel, has a certain pejorative connotation. The reasons for this are largely historical because, today, tramp shipping companies are, for the most part, highly respected and provide conditions aboard their vessels as high as the standards on some of the better liner companies. The life is different, however, because of the nature of their employment. There is normally no regular run, and, because time in port for the handling of bulk and general cargoes is short, a greater proportion of the time is spent at sea. In the days before radio communication was developed, the master of the ship was the commercial manager as well as the navigator. Even in recent years it was not unusual for the ship's company to be away from home for the full duration of the Articles of Agreement, viz. two years. Nowadays, the shipping company must be prepared to relieve officers and crew at certain maximum agreed intervals which, for British officers and crew, is normally about six months. This in itself leads to a need for a larger and more sophisticated organization.

In recent years, the evolution of the bulk carrier, operating on well-defined routes, such as Port Hedland to Japan or Tubarao to Japan with iron ore, or, in the tanker trades, the well-smoothed route from the Persian Gulf to northwestern Europe with crude oil, has to a certain extent blurred the definition of a tramp. In the same way as there has been difficulty in distinguishing statistically between a liner and a tween-deck tramp vessel, so there is the difficulty in distinguishing between tramps and bulk carriers. In both cases, the critical distinction lies in the mode of employment. In the words of the late C.F.H. Cuffley, the tramp vessel can be distinguished by its employment on the open freight market. The present functions of this market can be summarized under five headings:-

1. To provide shipping space for all commodities whose annual movements as to over-all volume, direction of voyage and individual cargo tonnages cannot be predicted with accuracy.

2. To transport marginal tonnage requirements in respect of those commodities (principally mineral shipments) where the bulk of traffic is lifted by integrated hired fleets, including the replacement of 'contractual' ships which fall out of scheduled loading position.

3. To provide the cargo liner system with a reserve of shipping space to deal with seasonal and other temporary 'flushes' of cargo and fill gaps in advertised liner sailings due to delays or casualties.

4. When individual cargo tonnage is sufficient to compose full cargoes to offer shippers lower rates than those of 'conference' tariffs.

5. To provide a pool of readily available shipping which can be switched to meet international emergencies and calamities — such services ranging from the

alleviation of human suffering to the sustenance of armed conflict between nations.

These points indicate the flexibility of tramps in moving between the liner and bulk shipping sectors. Their ability to switch seasonally from grain trades in the northern hemisphere to sugar trades in the southern hemisphere or from timber to scrap iron trades as demand changes provides a pool of readily available tonnage which the open freight market co-ordinates in a manner which helps to stabilize the supply and demand situation in sea transport.

Many hundreds of shipowners, each acting independently of the other, control the world supply of tramp vessels. Each makes his own investment decision, influenced to a large extent by the prevailing level of profits. Although in the long term the supply of tonnage tends to equal demand at an equilibrium freight level equal to the cost of transport, supply and demand are apt to become out of step very quickly. Freight rates are fixed by the market and, in spite of the mobility of tramps, rates can fluctuate dramatically even over short periods. Some economists regard the tramp freight market as the best example of a perfect market. This is not so true today because of a number of factors including the vast number of ship types and sizes which comprise the supply of tramp vessels. In the pre-war and early post-war days, the typical tramp ship was a tween decker of some 6-10,000 dwt with reciprocating steam engines and speeds of 10-12 knots. The many hundreds of 'liberty' ships built to standard design in the United States and elsewhere during the Second World War helped considerably in standardizing the tramp transport unit for some twenty of the post-war years. These now extinct 'liberty' ships have been replaced by other vessels of standard design, including the Fortune, Freedom and S.D. 14 classes. The S.D. 14 has proved a very popular ship with shipowners all over the world. Designed by Austin and Pickersgill of Sunderland, it is also constructed by foreign shipyards under licence. However, many tramp shipowners now prefer to own and operate bulk carriers, thereby sacrificing a certain amount of versatility for economies of scale.

The tramp freight market is a concept rather than a physical entity. However, in London, one of the most important centres for world banking and shipping operations, there exists a market place where shipbrokers and shipowners can meet and talk freely with information coming in from all over the world. Virtually all tramp and liner owners are represented either through their own office or by brokers on the Baltic Mercantile and Shipping Exchange, generally known as the Baltic. There are two sessions a day, one in the morning when information is coming in from the western hemisphere, and another in the afternoon when information comes in from the East. Fixtures are agreed orally between owners' and charterers' brokers after consultation between them and their principals. The motto of the Baltic is 'Our Word Our Bond'. A panel of arbitrators is available in case any differences of interpretation arise in the contract, but any

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sharp practice may involve a shipping or broking firm in suspension or expulsion from the Baltic — a very serious matter from a commercial aspect at least.

The traditional tramp cargoes are, in addition to general cargoes, those bulk cargoes many of which move in relatively small shipments and whose totals individually do not represent a very large proportion of world trade. These cargoes include fertilizers, grain, coal, bauxite, concentrates, scrap metals, timber, salt, cement, copra, sugar, esparto grass and sulphur. Coal and iron ore, two of the most important bulk cargoes in world trade, are carried principally in large bulk carriers, much of this business by-passing the open freight market.

The ability of shipowners to choose between several different offers of employment for their vessels tends to equalize freight rates in all trades in respect of profitability. Some owners prefer not to carry certain cargoes because of damage to ships or because of claims for cargo damage or because of unsatisfactory experiences of particular ports. In these circumstances, a premium may be paid on the general rate level for added risk.

Charters which are arranged on the Baltic or open freight market are normally of short duration, not exceeding 2 or 3 years. They fall into the following categories:-

1. Voyage charter where the shipowner pays all the expenses of the voyage including cargo-handling costs unless otherwise specified in the charter party in return for a fixed rate per ton of cargo carried. The shipowner must take into account the cost of the ballast passage to the port of loading.

2. Consecutive voyage charters — usually for 2 or 3 voyages over the same route with the same type of cargo.

3. Time charter where the ship, fully manned and maintained, is hired out to a charterer for a period of time. A short-term time charter can take the place of a voyage charter, but the charterer pays all voyage costs including fuel, port charges and cargo-handling costs. A period charter is normally of longer duration.

4. Bareboat charter. This is less common on the open freight market. The charterer hires the ship and pays all running costs including manning, although, in some cases, the shipowner appoints the master and chief engineer.

The levels of freight rates dictated by supply and demand are cyclical in nature. During a trough, which tends to be of longer duration than the peaks, there are normally many ships laid up for lack of employment. An increase in activity is treated cautiously at first, but, as a period of increase in economic growth or other circumstance leads to increased demand, charterers react by trying to fix vessels for their commitments as far ahead as possible. A certain amount of tonnage is also fixed on a speculative basis. As activity gains in momentum, the action of charterers in fixing tonnage further and further ahead only serves to accentuate the shortage and to drive rates ever higher. The process of chartering continues and the boom persists until such time as charterers find they have overcommitted themselves and begin to withdraw from the market. Freight rates begin to fall and the downward trend is accelerated by the flood of re-let vessels

which appear on the market from charterers who, seeing little prospect of employment for the vessels they have taken on time charter, wish to cut their losses and sub-let these vessels before the market collapses. As with so many other markets, the tramp freight market feeds on itself to produce excessive swings and corresponding movements in freight rates. The voyage charter rates reflect the state of the market at the time, while the time charter rates of 6-9 month duration tend to reflect future expectations and therefore move faster than the voyage or spot market rates.

Tramp shipowners are not able individually to influence the level of freight rates by their actions. Thus, they are price takers. They can however make a number of decisions with regard to their vessels, based upon the prevailing or expected freight levels. They can either (a) sell, (b) lay up, (c) scrap or (d) charter. Most decisions are somewhat speculative in nature since the future cannot be forecast with any accuracy. The decision whether or not to lay up a ship is most difficult since the owner does not take this course of action other than in the expectation of a lay-up of at least 3-6 months. In a depressed market, freight rates are forced down to the level of avoidable (or variable) costs which include insurance, wages, stores, maintenance and repair and voyage costs. These costs represent the out of pocket expenses incurred in pursuing the voyage, but over a short period of time the shipowner may regard some of these costs as fixed and elect to continue trading at an operating loss rather than dismiss established officers and incur expenses of lay-up. Which ships lay up first in a low freight market is determined mainly by their cost structure which is governed by age, size and nationality of ownership. It is not always the smaller, less economical vessels that are laid up first however: draught restrictions in many ports may require the employment of the smaller shallow-draught vessel, while, for the larger vessel, cargoes may not be available.

The difficulties in balancing supply and demand are indicated by the rapid changes which can occur as follows:

Demand can be influenced by:

- (i) Strong economic growth leading to increase in trade and in particular to demand for industrial raw materials;
- (ii) Wars, floods and famines. Grain movements from areas of surplus to areas of famine provide a sound base for the employment of tramps;
- (iii) Strikes in a domestic industry leading to increased imports;
- (iv) Seasonal movements of grain and sugar;
- (v) The opening or closing of an important waterway such as the Suez Canal. The demand for goods is not affected, but since the demand for transport is measured in ton-miles, shortening or lengthening trade routes has an important influence;
- (vi) Changes in source of raw materials leading to a change in demand (ton-miles).

In the short term, the demand for bulk commodities is very inelastic and this leads to great fluctuations in freight rates in response to shifts in demand.

Supply can be influenced by:

- (i) Strikes in the ports of a major country;
- (ii) Seamen's strikes in an important shipping nation;
- (iii) Slow or fast steaming;
- (iv) Working overtime in port;
- (v) Utilizing ships more efficiently;
- (vi) Putting off drydocking and repairs;
- (vii) Laying up or bringing vessels from lay-up.

In the long term, supply is increased through the ordering and delivery of new tonnage and by technological improvements in ports and their facilities.

It is ironic that shipowners, by their unco-ordinated actions in ordering new ships during a boom period in shipping, hasten the end of the boom as the new tonnage is delivered. It is in fact much easier to increase supply than it is to reduce it. Situations involving oversupply are rectified in the course of time by scrapping old tonnage and by the growth in world trade.

Tankers

The operation of tankers before the Second World War was similar to the operation of tramp vessels. Most movements involved the carriage of refined products from the producer-based refineries in the United States, Caribbean and Abadan on the Persian Gulf. In the early twentieth century, most of the tankers were industrial carriers owned by the major oil companies, but, gradually, independent tanker owners of Norway, Greece and the United States under the so-called flags-of-necessity have emerged with fleets forming an important adjunct to oil company owned tonnage. At present, oil companies own some 28 per cent of the world tanker tonnage, independents own some 70 per cent and state-owned tonnage is approximately 2 per cent. The ownership of tankers by independents releases capital for exploration and production; nevertheless, the oil companies maintain control of about 85 per cent of the independent tonnage through long-term charters while employing the remaining 15 per cent or so on the spot market.

The transport of products from the refineries to the markets and local distribution is a complex process which is made somewhat easier by the high degree of control which the vertically integrated oil companies exert over the whole system. Computers are used to schedule vessels as required at the refineries and oil terminals. Demand is never constant; the severity of winters and the occurrence of summer heatwaves in the northern hemisphere have a considerable effect upon demand.

Since the Second World War, the size of tankers has increased dramatically from what was considered to be a large vessel, the standard T2 tanker, to the 477,000 dwt vessels owned by Globtik Tankers which are in service to-day. The reasons for the growth were threefold:

1. *Commercial considerations.* For strategic reasons, including security of supply, refineries became more firmly market-oriented. The long hauls of crude oil which favoured larger vessels for the increasing volume of trade were reinforced by the need to offset losses incurred in refinery operations.

2. *Economies of scale.* In almost every cost centre, economies in terms of cost per ton of cargo could be made by

increasing the ship's size. For example a tanker of 50,000 dwt would have the same ship's complement as one of 100,000 dwt. Insurance is the one cost item which increases out of proportion to the size of the vessel. The fact that insurance accounts for some 50 per cent of the daily running costs of a Vlcc is an indication of the magnitude of this cost.

3. *Technical.* Improved boilers, improved techniques in welded ship construction, corrosion control and design have all helped to make possible economies of scale as mentioned before.

The closure of the Suez Canal in 1956 and 1967 only served to encourage the trend towards larger vessels. There are four main reasons why tankers have increased in size to a greater extent than other vessels:

- (i) Large volume of cargo;
- (ii) Rapid turnaround in port made possible by the development of cargo-handling pumps and lines to match the tanker's capacity;
- (iii) Low storage costs;
- (iv) The ability to load and discharge through off-shore terminals.

More recently, participation agreements by the oil-producing countries in the Middle East and Africa, including outright nationalization in some cases, have encouraged those countries to enter the downstream operations of oil refining and transport. A great deal of the oil which was controlled by the major oil companies now forms part of national trade agreements or is sold direct to the independent oil companies. The power which the oil companies possessed for so many years now appears to be ebbing away in the face of the newly found strength of the OPEC cartel. The major oil companies' share of tanker tonnage on order is now only 17 per cent.

Prior to 1967, the Suez Canal was able to allow tankers drawing some 38 ft to transit safely. This represented a vessel of about 60,000 dwt fully laden. Before closure, however, the restriction on size resulted in larger vessels transiting partly laden and then topping up at the Mediterranean terminal of Banias served by the Trans-Arabian pipeline. Other vessels up to 200,000 dwt could transit the canal in ballast and return fully laden via the Cape of Good Hope to northwestern European ports. Still larger vessels could transport crude oil more economically via the Cape both ways.

For example, prior to nationalization of its Libyan interests, B.P. was able to increase output in its North African fields at the expense of its Middle East production according to the level of freight rates which had to be paid for chartered tonnage. There is a premium on posted prices for oil from Mediterranean sources due to the short haul to the European market and also, in the case of Libyan oil, partly to the higher quality of the oil. Hence, when freight rates are high, there is a shift of emphasis in favour of Mediterranean sources. This action has the added benefit of relieving the demand for tanker tonnage to a moderate extent.

Approximately 10 per cent of all oil tonnage is lifted under open freight charters, but tankers employed in this way are not likely to prove profitable in the long term. Zannetos Z.M. regards employment on time charter to be essential for at least part of a tanker's economic life.

The average size of tanker currently on order in the over 150,000-dwt category is of 290,000 dwt, while a popular size is in the region of 400,000 dwt. The development of tankers in the Vlcc and Ulcc leagues has resulted in a change in the relationship between the vessel's fundamental dimensions. Greater emphasis is now placed on increasing the beam, albeit at greater cost, since draught tends to be the most restricting factor in tanker operations. The fact that there are relatively few ports capable of handling Vlccs and still less the Ulccs has led to new techniques for discharging and, in some cases, for loading these tankers. The development of trans-shipment terminals, two-port discharge, with one a deep-water port, the development of new ports in deep water or by heavy capital expenditure on dredging, the use of single and multi-buoy moorings in deep water, the construction of man-made islands and lightening at sea into specially modified tankers are all important aspects of tanker operations to-day.

Risk of pollution in the 'Torrey Canyon' category has had a profound effect on IMCO design regulations which will limit the size of cargo tanks and introduce segregated ballast tanks for vessels over 70,000 dwt. Serious explosions in Vlccs and combination carriers have caused great concern and have resulted in many companies incorporating inert gas systems into their tanker designs.

The continuous rapid growth in oil consumption and sea-borne trade, together with the fact that the United States oil production had reached its peak, led tanker owners to expect an accelerating demand for tonnage in the coming years. However, the cut-back in production in certain Middle East countries towards the end of 1973, coupled with the quadrupling of posted prices, has resulted in a contraction of demand by most countries and an attempt to establish 'project Independence' in the United States. The objective in the United States is to develop alternative energy resources rapidly in order to regain its former position of self-sufficiency. The consequence for tanker owners is now very serious since there are 200 million dwt to be delivered over the next four years in a situation where there are now some 15 million tons unemployed.

Bulk carriers

As mentioned earlier, the distinction between tramp vessels and bulk carriers is blurred. Bulk carriers are single-deck vessels, many of which are strengthened to carry ore and steel products. Some are over 100,000 dwt and the number and deadweight tonnage have developed rapidly since the early 1950s in response to the demand for large quantities of industrial raw materials moving over longer distances as the nearby sources became exhausted. Steel industries, whose expansion in Japan and western Europe necessitated the import of ever-increasing quantities of iron ore and cooking coal, have required the use of cheaper transport obtained through bulk carrier operations. Steel industries also became increasingly dissatisfied with the open freight market as a means of obtaining tonnage requirements. Often the ships were not suitable or not obtainable as required, while fluctuating freight rates made accounting difficult. At the same time, shipowners were not generally willing to employ these very

capital-intensive vessels in the vagaries of the open freight market.

Consequently, there has emerged the "contractual tramp" typified by the large bulk carriers of to-day. These vessels, drawing between 40 and 50 feet, are limited in their operational versatility but benefit through economies of scale. Contractual tramps are tied through the medium of long-term time charters to industries or to consortia serving these industries at rates which reflect the shadow price rather than market rates. By such arrangements, the shipowner sacrifices the possibility of making large profits for security of employment.

Combination carriers. These are bulk carriers specially designed to carry dry bulk cargoes or iron ore or crude oil (OBO) or iron ore or oil (OO) as alternative cargoes. An alternative method of servicing the needs of the steel industries has developed through the contract of affreightment (COA). Such contracts are made between shipowner or consortium and the charterer without reference to a particular vessel and are commonly at a fixed rate over 2 or 3 years. They are particularly useful for industries which have a steady flow of imports or exports, but cannot fully employ vessels of an appropriate economic size on a long-term basis. The very large vessels which service these contracts are restricted in their trades and cargoes, spending an average of 50 per cent of their time in ballast, whereas the more versatile tramp is able, by switching trades and cargoes, to reduce dead steaming to 30-40 per cent. Consequently, the combination carriers were designed, at greater cost, to enable employment to be switched from dry cargo to oil with a minimum of ballast time. It has been estimated that combination carriers would need to increase their ratio of loaded/ballast time to 60/40 per cent in order to offset the increased capital and operating costs. Combination carriers were not designed to switch trades from dry cargo to oil as market conditions changed, although, in the boom periods of 1970 and 1973, combinations which were free of contracts switched completely to the oil trades. Since the downturn in the tanker market following the greatly increased cost of oil, there has been a gradual switch back to the grain and coal trades, which, until quite recently, have remained buoyant.

Because OBO carriers are designed to carry bulk cargoes in addition to ore and oil, their size has been restricted to a maximum of about 150,000 dwt. Even then, coal is the only bulk cargo which moves in such quantities. Unfortunately, this size is not very competitive with the Vlccs in the oil trades so that OO have recently been favoured in preference to OBO carriers. Iron ore moves in quantities up to 260,000 tons, which gives employment for a size of vessel that can compete with a Vlcc on equal terms.

Possible trades for an OBO carrier might be:

Persian Gulf — Rotterdam: Crude oil
Rotterdam — Hampton Roads: Ballast
Hampton Road — Japan: Coal
Japan — Persian Gulf: Ballast

For an OO carrier a composite trade might be:
Persian Gulf — S. America: Crude oil

S. America — Japan: Iron ore
Japan — Persian Gulf: Ballast

Specialized carriers

These carriers are designed to carry specific cargoes more efficiently, i.e. at lower cost or less risk of damage, or for the carriage of cargoes which could not otherwise be carried, e.g. refrigerated, heavy lift, container and other unitized cargo, L.N.G. and L.P.G. and ammonia, bulk cement, phosphorus and sulphur, wood pulp, cattle, cars, wine, slurry and molasses.

These may or may not be industrial carriers integrated into the down-stream operations of an industry and, although they may be designed specially for one or two commodities, this does not necessarily preclude them from carrying other goods on the return voyage.

L.N.G. ships which are now being built to carry up to 125,000 cubic metres of liquid methane have enabled markets to be established for oilfield gas which has traditionally been flared off or used in some cases for increasing production from the oilfield. These are noteworthy for their very high cost of construction and for the advanced technology which has made their construction possible. The number of shipyards capable of submitting competitive tenders for these vessels is strictly limited. The tankers alone cost upwards of \$100 million, but it does not stop there. Liquefaction plants and storage tanks also demand high capital investment, and so alternative methods of transport including balloons and conversion of methane to the liquid methanol are being considered.

Carriage of cargoes in specialized carriers sometimes involves the transformation of the cargo into a semi-pro-

cessed state, e.g. the conversion of bauxite into alumina or alumina into aluminium. The advantage here is that weight is reduced while the commodity required becomes more concentrated. Pelletization and beneficiation of ores are other processes of a similar kind. Economies are further enhanced if there are cheap sources of power at or near the point of production.

Other specialized vessels are designed so as to handle traditional dry bulk cargoes in a liquid form and thereby enable the cargo to be handled at a faster rate by pumping. Such vessels include:

(a) Slurry carriers pioneered by the Marcona Corporation of San Francisco in which iron ore is slurried before pumping on board, the water decanted and then re-slurried before pumping ashore at the port of destination where it could alternatively be handled by the conventional grab method. Coal can also be slurried, but processing costs may offset the reduced transport costs associated with slurry processes.

(b) Phosphorus carriers where liquid phosphorus is transported and pumped ashore in a hot liquid state in place of the conventional carriage of phosphate rock which would be converted to phosphorus at market-based plants. The carriage of liquid sulphur and ammonia are similar examples.

As the specialized carriers become larger and more sophisticated, the number of vessels has to be tailored more precisely to suit market requirements. Fluctuations in demand cannot readily be catered for, and vessels which fall out of schedule through accident or engine breakdown cannot be replaced easily by chartering on the open freight market. Thus, reliability in operation and thoroughly competent crews must take on new meaning to the owners or operators of these ships.

THE ORGANIZATION OF A SHIPPING COMPANY*

The organization of a shipping company can take on greatly differing characteristics depending upon type, e.g. liner, container, ship, tramp, bulk carrier, tanker, and also upon the size and diversification of the company. Comparisons are not made easy by the fact that different organizations use different names to describe the same management functions.

The company structure of tramp and liner shipping evolved in different ways, due to the different capital requirements. Throughout the nineteenth century, tramps tended to be one man/one ship or family concerns, growing as profits allowed. On the other hand, the establishment of liner service required investment in a number of ships, and equity capital was normally used.

From early beginnings, the following types of company structure have developed: —

- (i) Private shipping company.
- (ii) Private management company with publicly-owned shipping company.
- (iii) Publicly-owned shipping company (liner, tanker or tramp).
- (iv) Industrially-owned, vertically-integrated shipping company.
- (v) Management companies.
- (vi) Consortia.
- (vii) Associated companies.
- (viii) Flag of convenience companies.
- (ix) State-owned companies.

R.J. Eaton (Elements of Transport) indicates that there are basically seven different functions performed by a transport undertaking. These are:

- (i) Policy
- (ii) Legal and secretarial
- (iii) Engineering
- (iv) Commercial
- (v) Operating
- (vi) Research and development
- (vii) Accounts.

The commercial and operating departments are sometimes combined together as the Traffic Department.

A typical British tramp shipping company might have an organization of a similar pattern but modified slightly as follows: —

- (i) Board of Directors
- (ii) Secretarial and finance
- (iii) Technical
- (iv) Chartering and operations
- (v) Personnel
- (vi) Purchasing
- (vii) Accounts

Research and development is not usually undertaken by the smaller shipping companies in the United Kingdom but by the British Ship Research Association (B.S.R.A.) through funds contributed or fees paid by shipowners. Again, most of the smaller shipowners cannot justify a

legal department, but employ the services of a solicitor specializing in maritime matters as required.

The Board of Directors. The board consists of perhaps ten directors, most of whom are also executive heads of departments. The Board's function is to deal with matters of policy, corporate planning and strategy and also to deal with such matters as cannot be delegated to the day-to-day decision-making of one department.

One of the major decisions taken by many European shipowners in recent times concerns the investment in drilling rigs, licences for exploration, offshore supply vessels — all connected with activities in the energy-abundant North Sea. Other matters may concern the co-operation with other shipowners in consortia and cargo pools. The promotion of chief officers and second engineer officers to the responsibilities of master and chief engineer respectively are also decided at Board level. This indicates the importance of seeing that valuable vessels are placed in the care of only thoroughly competent and reliable officers. Decisions whether or not to lay up or charter in vessels may all be taken at this level.

In an organization of this size, meetings can be arranged at short notice and decisions can be arrived at quickly with the minimum of formality. The present-day tendency to design offices on the open plan system aids communication between directors in the course of their daily activities; other problems concerning privacy and noise may however arise.

Meetings of the board are instrumental in keeping the chairman and directors fully informed of others' views and activities in progress in departments other than their own. The company secretary, who may or may not be a director, is present at most board meetings to keep the minutes.

Directors of a tramp shipping company such as this are usually either members of a family with substantial shareholding or have worked for the company for a great many years. It is highly unlikely therefore that a director of one tramp shipping company could resign and join another one in a similar position.

The Secretarial Department. The secretary and his assistant(s) deal principally with company affairs. The secretary may be an accountant by profession, but, in any case, he must have a good knowledge of accounting principles in order to prepare the company's annual statement of accounts. The secretary therefore is responsible for seeing that the Companies Acts of 1948 and 1967 are complied with and, in particular, that the accounts show a true and fair view of the state of affairs of the company at the financial year end.

The secretary supervises transfers and issues of shares, payments of dividends and accepts service of legal papers drawn against the company. He also deals with documents relating to ship purchase and loan finance. The department also administers the pension fund and maintains a portfolio in accordance with the requirements of the Department of Employment. Loans are serviced, taxation paid and trial balances made monthly by this

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department. The secretary is also responsible for calling shareholders' meetings as required and the promulgation of business to be discussed.

Finance Department. This department is closely linked to the secretarial department and the work is concerned with matters relating to the preparation of annual accounts. It is also necessary for the Finance Department to provide financial statements for decision-making by the Board. These may relate to chartering in, laying up, investment appraisal, taking into account grants, taxation and capital allowances. Availability of cash for loan servicing and other commitments must be monitored by this department.

Chartering and Operations. This department, under the control of a director, most nearly follows the pattern of Eaton's traffic department. Operating virtually as one unit, there is a branch office at the Baltic Exchange where the tramp market is concentrated. Most tramp shipowners, whether British, Greek, Norwegian or Japanese, are represented on the Baltic by company personnel or by shipbrokers. It is here that the first attempts are made to match cargoes to available tonnage. The shipping company's chartering department will be linked by telex to the London office for market reports received twice daily. The chartering department keeps a continuous watch on fleet movements and their requirements. Vessels fixed on period charter require little in the way of day-to-day management since charterers effectively control the vessel's movements. As far as possible, new fixtures or contracts are arranged for vessels shortly before their present commitments are completed so that these follow on from the previous employment without delay. The Chartering and Operations Department must keep in close touch with all other departments because these have organizational arrangements affected by the vessels' itineraries. In arranging charters, which are all fixed in the company's head office rather than in the London office, consideration must be given to:

- (i) Surveys due
- (ii) Drydocking
- (iii) Crew repatriation
- (iv) Officers' leave requirements
- (v) Damage and repairs.

Voyage estimates are worked and historical analysis performed in order to provide a check on the accuracy of data used.

Agents must be informed of vessels' movements and requirements and bunker stems organized. A copy of the charter party should always be given to the master in order that he can safeguard the company's interests. Fleet movement lists are circulated from the department every day so that all departments are kept fully informed. The operations manager negotiates bunker contracts with the major oil suppliers, although, in some companies, owners prefer to purchase bunker oil on the spot market.

Technical Department. This department, headed by an engineering superintendent who is also a director, is responsible for the maintenance of the fleet in efficient working condition. This is mainly an engineering function which is administered by a number of highly-qualified engineer, electrical and marine superintendents. In some

larger companies, the Technical Department will also design vessels for fleet replacement and undertake some research and development work. The work, encompassing engine, deck and radio departments, falls into three main categories, viz. maintenance, repairs and surveys. A large part of the maintenance work is carried out by the ships' crews and therefore close liaison must be maintained between the ship and the Technical Department. Unscheduled breakdowns can mean time out of service, with loss of hire or extra days on voyage. Time out of service can be extremely expensive for a large vessel and so the technical department must be particularly cost-conscious. Maintenance and repairs are usually carried out on a planned maintenance basis which may be controlled by computer programme. Surveys can be incorporated in the programme and scheduled to fit in the ship's programme. Maintenance and repairs in drydock comprise a considerable item of expenditure, but, in inviting tenders, due regard must be paid to time and reliability. If the vessel is employed on a regular trade route, there may be little freedom of choice. Machinery surveys are arranged on a continuous basis in order to ensure that most of the work can be accomplished during normal periods in port required for cargo-handling purposes. The system does entail a certain amount of work being accomplished at sea with the Chief Engineer being granted powers to survey on behalf of Lloyds.

Close liaison must be maintained with the Operations Department in order to avoid conflicting with charter requirements. In vessels up to 45,000 dwt, maintenance of a normal nature is performed by ship's crews. Above this size, more work must be accomplished by shore-based work forces, including drydock labour. Drydocking periods have recently been increased above the traditional 12 months through the introduction of better-quality anti-fouling paints. Experience varies, but, in many cases, 18 months is still the limit between drydocking if excessive fouling is to be avoided. Recent increases in the price of bunker fuel have made it even more important to keep the ship's hull free from fouling.

Traditional departmentalized maintenance schemes have given way in recent years to the employment of work forces organized by shipboard management teams. The work forces comprise general-purpose (G.P.) crews or others signing on by department but with inter-departmental flexibility (I.D.F.). Work programmes are carried out on deck or in the engine room, according to conditions or urgency, and progress is reported by letter every two months. The flexibility contained in this system of shipboard working lends itself to planned maintenance and shipboard management teams who can organize work more easily. These crews are usually paid at a higher rate than the departmental crews and also have correspondingly higher overtime rates. Although crew numbers are smaller, there is some controversy as to whether G.P. crews are cheaper for the shipowner than the traditional arrangements. However, only G.P. crews are suitable on tankers, bulk carriers and container ships.

Asian and Chinese crews are often employed in British flag vessels and are generally preferred for reliability by employees and officers who sail with them.

Superintendents of the Technical Department super-

visé new buildings and one may be appointed as company's representative in a foreign port at which the vessels regularly call.

Five-year maintenance plans are operated for the vessels and overtime is worked on board as necessary. Cost control ideas are gradually being introduced so that ship management teams are able to assess the cost of all jobs performed on board and, with this knowledge, utilize the crew in the most effective way. Working on the planned maintenance schedule, a budget is computed, with due allowance for inflation, for each vessel for a 6-month period. This information is supplied to the Operations Department to enable voyage estimates to be computed more accurately. Spare gear for deck and engine equipment is the responsibility of this department.

Some companies have a job specification manual for all Officers and P.O.s. This ensures that each person knows exactly what he has to do. However, others feel that this leads to inflexibility and they prefer to leave each master free to allocate jobs. Paperwork on board is a problem. Most of it is designed to keep shore staff informed and to provide a check on activities. Planned maintenance unfortunately lends itself to excess paperwork which may never be properly checked by shore superintendents. Hence there arises the need for computer monitoring and control. Ship's personnel may override the maintenance programme as necessary, but caution must be observed lest, in a period of opportunity, so much extra work is performed that the same jobs will bunch together at a less opportune time in the future.

Accounts Department. This department takes care of the day-to-day receipts and payments of cash and also audits, through invoices, the payments of accounts. Useful analyses of voyage expenses are performed with the aid of a computer or programmable calculator and the information so obtained is passed on to the Operations Department.

Voyage disbursements, other than oil, are normally paid by agents who submit invoices for each ship and for each port of call. These are numerous and are passed to the purchasing or technical departments, as appropriate for authorization before payment. For the purpose of bookkeeping, when exchange rates are fluctuating, mean exchange rates in respect of foreign currencies taken over a period of one month may be used. Fuel bills are paid monthly in the United Kingdom and agents' fees paid usually on a scale related to the quantity of cargo loaded or discharged.

A ship's movements book is kept to record berth movements, tugs and pilots employed, and also a port charges book showing the total disbursements for each port. An analysis breaks down these costs under various headings, e.g. port charges (including tugs and pilotage), stores, repairs and stevedoring charges. Voyage accounts are kept on punched cards for each ship. An analysis of expenditure under the heading of ropes, wires, paint, lubricating oils, maintenance, stores, engine room (with subsections) surveys and repairs is made and a computer print-out for each vessel is obtained every month (with cumulative totals) but usually about six weeks in arrears.

A lay days statement from the ship's master on printed forms is used for checking freight due. Despatch

money is normally payable. Freight on grain shipments are payable in US dollars within 7 days. The accounts department must ensure that freight and charter-hire are received and, for ships chartered in, paid out by the stipulated time. Failure to ensure payment can lead to serious consequences.

One section of the accounts department specialises in marine insurance and protection and indemnity cover. Payments to and claims on these P & I clubs also pass through 'accounts'. Pooled freight earnings are collected and disbursed, office salaries are paid and management fees received.

Personnel Department. The main responsibility of this department is to engage crews of adequate qualifications, capable of manning and operating efficiently the ships belonging to or operated by the company. Many difficulties over manning have arisen in recent years and often ships have been sent to sea inadequately manned by normal standards. This department must see that Department of Trade standards are maintained both with regard to numbers of crew and also to standards of accommodation. Training must be arranged to suit fleet requirements and also the individual as far as possible. In times when good officers and crew are in short supply, every endeavour must be made to ensure that they do not leave the company because of general dissatisfaction or because of arbitrary treatment. The department receives reports from masters on the conduct and ability of officers and crew and deals with general promotion and company contracts. Advertising for officers plays an important role, and Asian crews are recruited through a pool established in their own country. The latter usually spend 9-12 months at sea before being repatriated for leave. Officers spend 4-6 months at sea, so that companies with ships which do not return to their home country on a regular basis inevitably incur very high expenses in replacing a crew when the ship is many thousands of miles from home. Medical expenses are also incurred from time to time, with hospitalization and repatriation expenses adding more to the manning costs. The shortage of officers in recent years has led to the situation where wives and children are allowed to travel with their husbands for at least some of the time. Some forward-looking companies have also recruited female apprentices. This may be a publicity gimmick or a genuine attempt to relieve the chronic shortage of qualified manpower in the merchant marine. Nowadays, all officers and ratings have bank accounts, and wages are credited directly to them. A voyage credit system may be maintained on board or cheques signed for purchases from ship's stores.

Other duties of the department include:

- (i) Crew mail.
- (ii) Joining and leaving expenses.
- (iii) Keeping next of kin informed of crew member's ports and addresses.
- (iv) Co-ordination of Asian crew changes.
- (v) Welfare and sickness. Fringe benefit schemes.
- (vi) Maintaining rota.
- (vii) Training deck, engine and radio cadets.
- (viii) Documentation, visas and joining instructions.

- (ix) Records of voyage credits.
- (x) Forwarding newspapers.
- (xi) National insurance and income tax.
- (xii) Asian overtime sheets.

Purchasing Department. This department is responsible for the supply and control of ship's provisions and stores other than spare parts. Most of the stores are purchased in such quantities as to last during the period of time that the ship is expected to be away from the United Kingdom. Because of bulk purchasing, discounts can normally be obtained, but individual orders are supplied direct by the manufacturer. Apart from urgent items and fresh foods which may have to be purchased abroad, all ordering is conducted through the Purchasing Department. Provisions are usually based upon Department of Trade standards. Some companies exercise quantity control over such items as paint, ropes, and cleaning materials, while others allow stores as required by the planned maintenance programme.

Voyage cost summaries indicate port of purchase and expenditure under the headings:

- (i) Provisions (ii) Cabin/galley (iii) Linen
- (iv) Deck ropes (v) Wires (vi) Deck paints
- (vii) Engine (viii) Engine paints (ix) Lub. oil.

Opening and closing stock is shown. The sheets cover purchases over a period of two years and a cost/day analysis for stores and average cost/man/day for provisions is calculated. Differing voyages make comparisons between vessels difficult, but such information helps to keep a constant check on costs which keeps the Operations Department up-to-date for voyage estimates.

Although there is a distinct difference in function between the several departments, enough has been said to indicate the strong information links which must exist across the departments in order to ensure the smooth and efficient operation of the fleet.

The small tramp company. In a small company, the same basic functions must be performed as in the larger company. The smaller company is less departmentalized and the functions less disciplined. Obviously, a company with only a few ships cannot support a large shore establishment.

A ship or fleet manager is in charge of the day-to-day operations, and an accountant, with junior office staff, sees to all the monetary matters, such as freight receipts, disbursements and salaries of shore and sea staff. Lack of formalized organization ashore often means added responsibility but greater flexibility and freedom for ships' officers. There is likely to be less paperwork as a result of closer direct contact between owners and ships' officers. Instead of employing superintendents to supervise the maintenance, repair and survey work of the fleet, consultants may be retained on a fee basis.

Such an organization will usually own less than six ships. In spite of the low organizational profile, it is very important for the small company to have an office at the Baltic Exchange. Astute contracts negotiated can, in terms of profitability, make up for a certain lack of efficiency in the fleet budgets.

The Board of Directors concerns itself closely with the day-to-day affairs and knows the ships' officers well;

the latter, as a result, are made to feel part of the company and show great loyalty.

Management companies. There are a number of companies which have, particularly in the post-war years, developed into management companies. These should be distinguished from the traditional arrangement in which a family-owned tramp shipping company creates, quite arbitrarily, a new company structure comprising a management company and a shipping line. From the management aspect, the distinction may be only theoretical since the Board of Directors may be substantially the same in each case. In some cases, the shipping line 'goes public' while the management company stays in private hands. This arrangement can ensure profits for the management company through fees charged to the shipping line, even in the event of operating losses being incurred.

The professional management companies however use their expertise to manage diverse fleets of other shipowners. The fleets may consist of a mixture of cargo liners, container ships, bulk carriers and tankers. The ships are usually grouped, according to type or for convenience, under the control of fleet managers whose main tasks are to co-ordinate all activities of ship operation from maintenance to manning and purchasing of stores.

There are a number of different levels of ship management which are possible these could range from a simple manning programme right up to total control and responsibility. The commercial activities, such as chartering, marketing and cargo booking, are not normally undertaken, since the shipowner naturally prefers to maintain some measure of control over the profits made by his fleet. Management of fleets for short periods is not normally considered because of the high initial cost involved in the organization of additional tonnage. Ships' officers need to be more versatile in their skills — few shipping companies expect officers, in the ordinary way, to transfer duties to tankers or bulk carriers from liners for example — and extra training is therefore needed. Officers would normally, for the sake of continuity, remain with the ships of one fleet for a period of two years or so before transferring.

In return for a management fee, shipowners expect to benefit from the experience of the ship management company and from economies of scale. The management company may even advise on and supervise new tonnage for clients and, due to the reputation and past record of the former, insurance premiums can be more attractive. Some complex situations can exist however. The holding company of one British management company has a wholly-owned subsidiary which owns a fleet of container ships demise chartered to an American company but managed by the same management company.

The fleet manager must keep in very close touch with the shipowner in order to co-ordinate surveys and drydocking in the trade pattern as determined by the owner and charterer.

The Accounts Department is not involved in commercial payments for hire and freight, but has the added responsibility of ensuring that shipowners deposit sufficient funds for the payment of ships' running costs as

they arise together with management fees as they become due. The management company may have a small fleet of its own, in which case a commercial or chartering department may be necessary. The organization of Common Bros. is shown in the chart below.

Because the function of management companies is justified mainly by the economies in costs, budgets must be carefully prepared and as far as possible adhered to. Contingencies must arise, but, if the shipowner is to plan his cash flow properly, he is entitled to expect his running costs will not significantly exceed the budget figure indicated by the management company.

Management companies can be very attractive to developing fleets and to the finance houses, merchant banks and conglomerates which have recently entered the shipping business for the purpose of avoiding taxation.

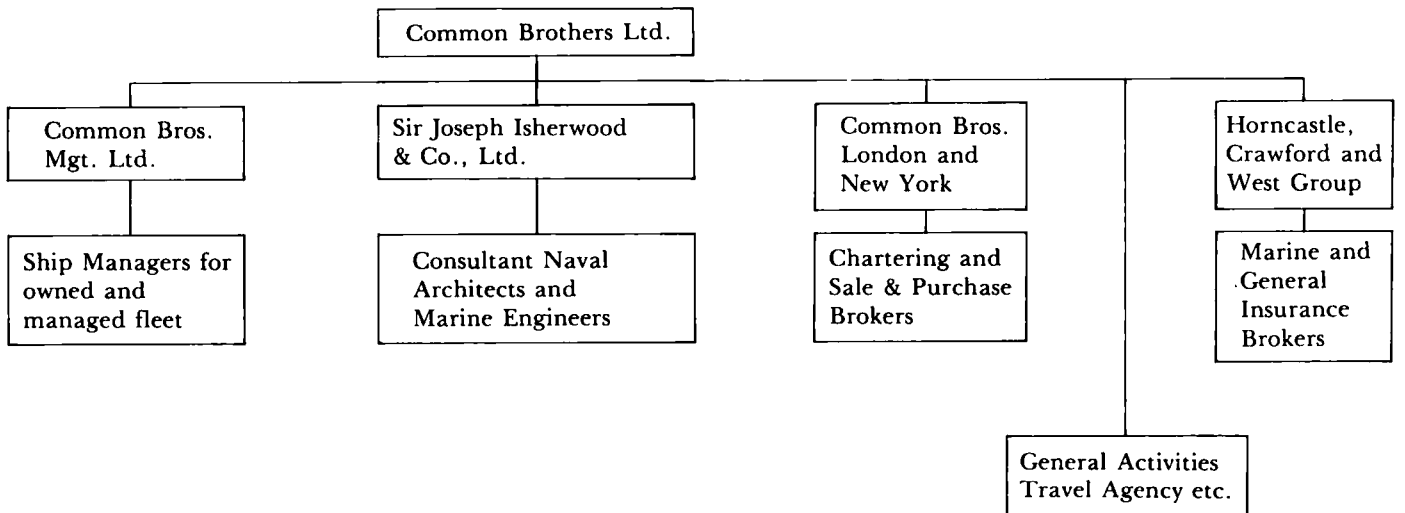
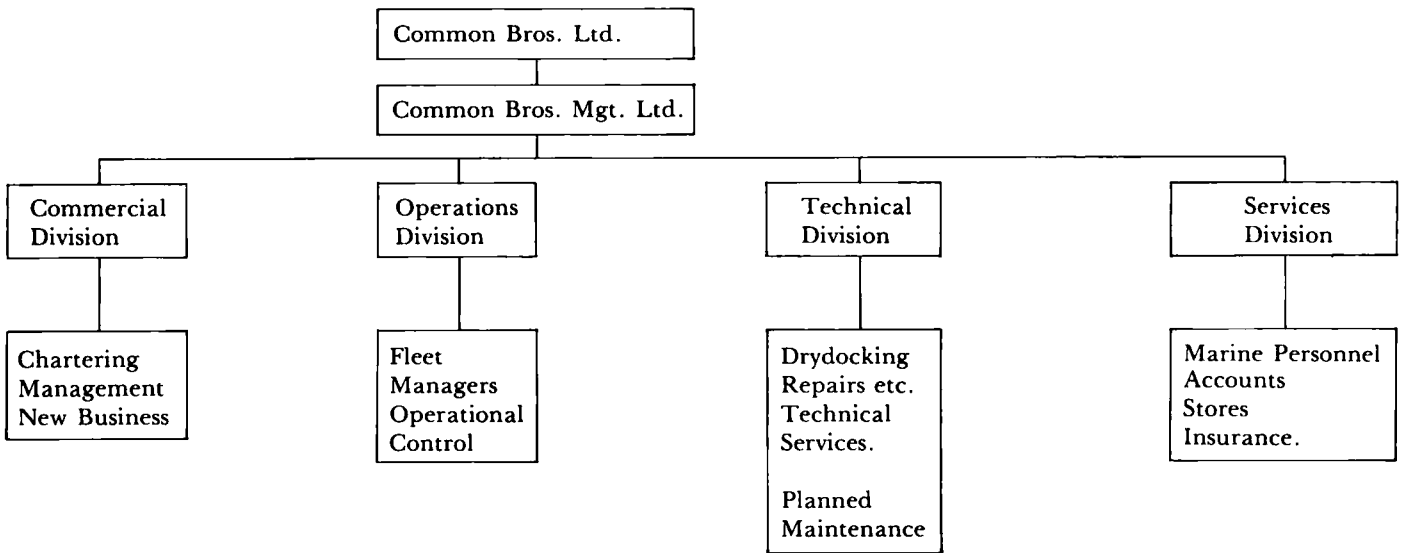
Both Common Bros. and Denholm Ship Manage-

ment have undertaken the training of sea and shore staff for fleets of developing countries in addition to managing some of their ships.

"Common Bros. as an established shipowner is always on the lookout for new management opportunities and the commercial department is currently being strengthened to this end. Ideally the group would like to develop into managers and owners of about forty vessels".

The commercial division is the first point of contact for potential clients and is responsible for appraising the financial viability of shipping ventures and trading routes, giving recommendations on trading opportunities and working out the detailed points of chartering arrangements.

Ship finance, assistance with bankers, the appointment of agents and towage contracts all come within its scope.



Consortia. This type of organization has become very popular and in many cases necessary during the past ten years or so. A consortia is strictly an unincorporated organization which draws together the resources, usually in terms of ship units, of two or more companies in order to perform a service more efficiently. In addition to container consortia, there are a number of bulk shipping consortia which specialize in contracts of affreightment. Combination carriers are particularly effective so that oil, coal and ore contracts can be serviced. The Seabridge consortium comprises Bibby, Bowering, Houlders, Hunting and Silver Line. In eight years, the company contracted sufficient business to employ a fleet of 2¼ million tons of pooled tonnage, augmented by a further fleet of 1 million tons of time-chartered tonnage.

Computer techniques were introduced to revolutionize fleet programming which became so complex at an early stage that flexibility was lost using manual programmes.

Consortia charter in ships from member companies and from the open market as necessary and profits or losses are divided in agreed proportions.

Associated company. This type of company, which is sometimes loosely referred to as a consortium, is exemplified by the container company Overseas Containers Ltd. (OCL). This company is incorporated and has shares subscribed to by four of the most powerful shipping groups in the United Kingdom viz. Ocean Transport and Trading (Blue Funnel), British & Commonwealth, P & O and Furness Withy. The container ships operated by OCL are chartered from the four owning groups on a bareboat basis. In this respect, OCL is similar to a consortium. It is expected however that, in the long run, OCL will be identified with its owning companies to a lesser extent and may issue equity shares directly to the public. It must be remembered that, in comparing OCL with a consortium, OCL could become bankrupt without affecting the owning companies beyond their invested capital, although loans granted to OCL may be guaranteed by the associated companies. OCL vessels

are managed by a separate company, Container Fleet Ltd., (those employed on the AECS) a wholly-owned subsidiary of P & O. However, the ships' crews are employed by OCL and the marketing function is also retained by them. Ocean Fleets manage the OCL vessels employed in the TRIO consortium.

Liner companies. Although performing essentially the same functions as tramp steamers, the commercial organization, due to the totally different nature of employment, is far more extensive and complex.

Liner companies have expanded in size mainly through mergers and amalgamations. Two of the largest companies traditionally specializing in liner operations have recently diversified into bulk, oil, chemical and offshore supply vessels. In addition, these organizations became so vast that reorganization was undertaken and accomplished. The P&O management organization was restructured into six divisions in 1970/71, viz.

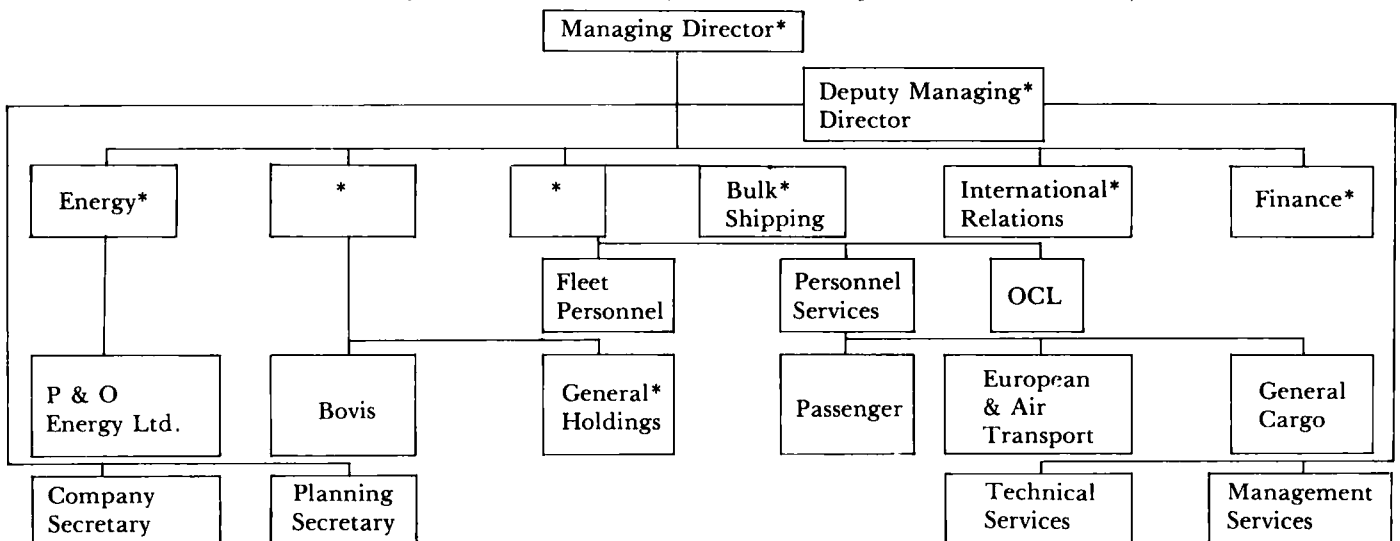
- (i) Bulk Shipping Division
- (ii) General Cargo Division
- (iii) Passenger Division
- (iv) European and Air Transport Division
- (v) General Holdings Division
- (vi) Energy Division

The executive management structure is shown in the chart below.

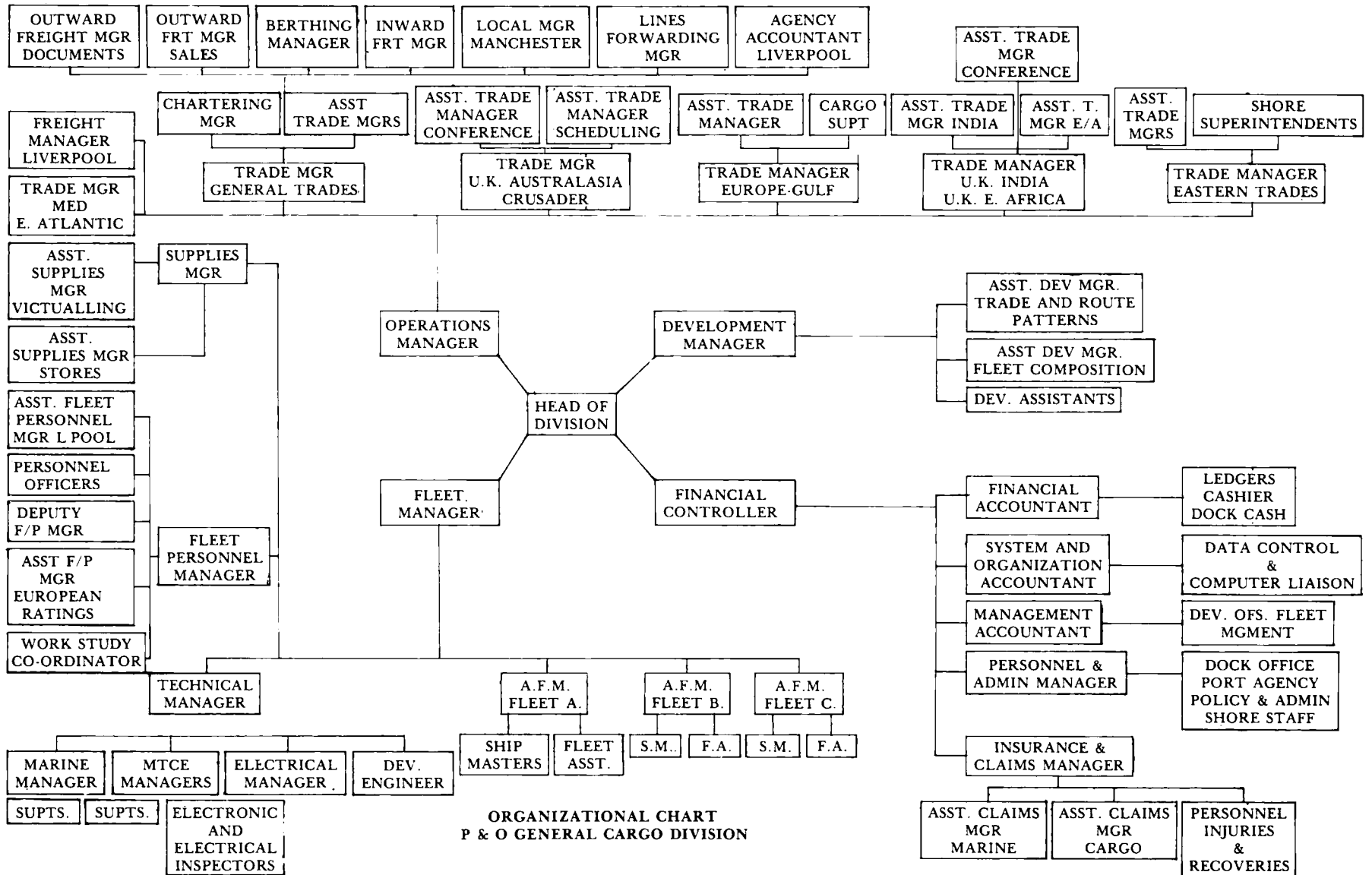
In 1973, a divisional management structure was introduced throughout Ocean Transport and Trading Ltd. This comprises:

- (i) Executive Committee of the Board
- (ii) Ocean Titan (Non-liner shipping)
- (iii) Ocean Liners Ltd.
- (iv) Ocean Mercantile Investments Ltd. (forwarding)
- (v) Wm. Cory Division (fuel, wharfage, lighterage)
- (vi) Mansfield Division (group interests in Singapore)
- (vii) Ocean Fleets (ship management services)
- (viii) Staff and Service Functions.

P & O Management Organization (from Annual Report and Accounts 1974)



*Directors of P & O



ORGANIZATIONAL CHART
P & O GENERAL CARGO DIVISION

P&O General Cargo Division. The structure of this division is broadly similar to the other divisions and is shown in the chart below.

Directly responsible to the head of division are four managers, viz. Operations Manager, Fleet Manager, Development Manager and Financial Controller, each responsible for a specific function within the division.

The Development Manager has three assistants studying the efficiency of fleet composition and utilization in relation to trade patterns. Research and development is related to the commercial side of the business, especially in cargo-handling systems and appliances both on board and at the berth. Stowing, dunnaging and ventilation methods are also assessed for efficiency.

The Fleet Manager is responsible over-all for the manning, maintenance and supplies of the vessels contained in the division. The division operates a fleet of 75 ships so that a relatively large staff is involved in this aspect of ship's husbandry.

The Financial Controller has over-all responsibility for the various accounting groups, including those of the operations and fleet management sections. Insurance and development expenditure also form part of the financial controller's responsibility. Voyage analyses are performed and checks kept on budgeted expenditure.

The Operations Manager: the main difference between the tramp and liner organizations lies in the organization required in the latter to schedule vessels, book cargoes, load and discharge cargoes, prepare documents and deal with numerous claims.

In some organizations, the operations manager is responsible for the efficient running of the vessels and would adopt the role of fleet manager. In P & O however, the operations manager is responsible for the commercial function of the division. He is one of the four executives directly responsible to the head of the division. Working directly under the operations manager are a number of Trade Managers, each responsible for a trade route or a small group of trade routes. These have different characteristics; for example, the UK/New Zealand route is tightly controlled and, with freight and revenue pools effective in a closed conference situation, there is little need for marketing. The trade manager is responsible for working with the conference to serve the trade in the most economical manner. To this end, meetings are arranged on a weekly or other frequent and regular basis. Having rationalized the company structure, a company such as P & O which serves many different trade routes with its large fleet is able to redeploy the vessels from one route to another as the need arises.

In London, the cargo bookings are arranged through a co-operative firm, Eastern Shipping Services, which therefore books cargoes for other lines also and specializes in the Eastern trades. Any special bookings with regard to quantity or type of goods are carried as far as possible by the vessels of the division. Otherwise, vessels are chartered in as necessary to fulfil the commitments.

Trade managers work on a budget and control directly some 50 per cent of the costs of carriage in berthing, port charges, cargo handling and agency fees. Other costs are supplied by the fleet management

department. The aim of the trade managers is to produce a full shipload of cargo and to ensure that the costs of carriage do not exceed the revenue earned. Whether or not calls are made at direct ports will be the subject of decision by trade managers in relation to the budget. Increases in costs through wages, repairs, fuel, congestion and so on may lead to recommendation to the conference for an increase in freight rates either generally or by application of surcharges.

The organizational chart shows the attachment of cargo super-intendents to one Trade Manager, but this is simply for convenience. The organizational influence also appears stronger on the west coast (Liverpool) where cargo bookings and documentation are made by the company rather than by agents as in London.

In trade routes which are not so tightly controlled by freight and cargo pools, the conference may only have agreements for sailing rights in addition to the usual agreements covering freight rates. In such cases, marketing becomes a very important function in ensuring that the company maintains a fair share of the trade and is able to despatch ships with high load factors. Sales forces are therefore very active in the industrial centres and every effort is made to ensure company loyalty by the large and important shippers. This is yet another aspect of the Trade Manager's area of responsibility.

Voyage estimates

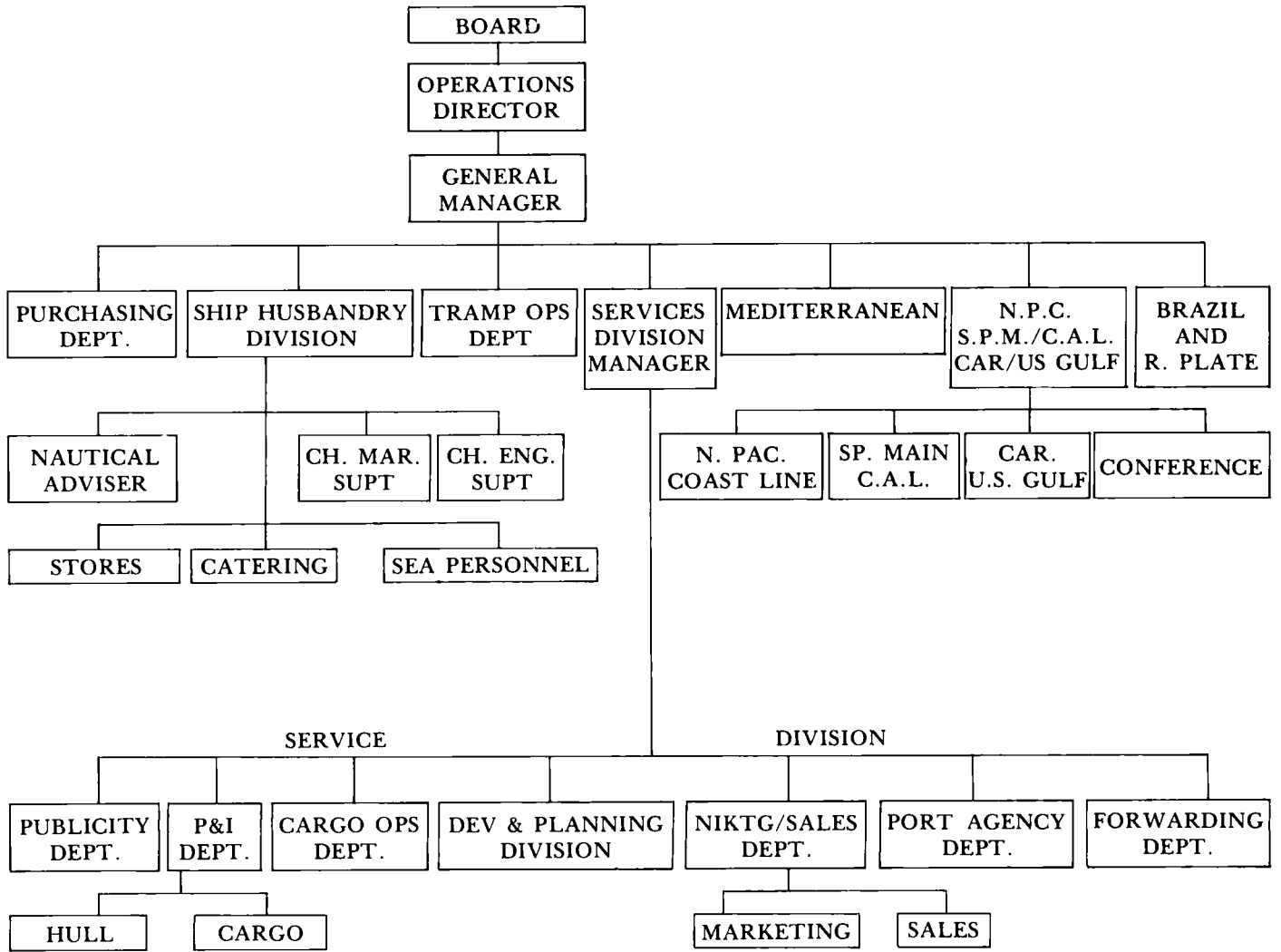
Voyage estimates are used by owners in respect of tramp vessels or tankers which are employed on the open freight market. There are two kinds of estimates in common use:

- (i) Standard estimates;
- (ii) Single voyage estimates.

The standard estimate is used to establish a 'standard' for each class of ship. In the case of tankers, *Worldscale 100* may be used as the relevant freight level and, on the assumption that the ballast and loaded legs are of the same length, any voyage chosen should yield the same result in terms of profit per day. At the same time, the incremental profit corresponding to an additional 10 points *Worldscale* is calculated. In the long term, the loaded and ballast legs for tankers tend to be equalized, although, in the short term, the two legs of an individual voyage can be of greatly differing lengths. The standard estimate therefore can be used to forecast to a considerable degree of accuracy the profits which will be earned by a tanker for the year when a given *Worldscale* level of freight rates is assumed.

Similarly, for tramp vessels, standard estimates are prepared, allowing for equal ballast and loaded passages, for certain typical trades, such as US Gulf — Rotterdam or Great Lakes — Avonmouth. Because the level of freight rates tends to be such as to yield similar profits in all trades, again, the standard estimate can be used to forecast profits for the year on the assumption of a given freight rate.

Single voyage estimates are used for estimating the profit to be earned from a particular voyage under



LINER SHIPPING COMPANY ORGANIZATION (SIMPLIFIED) ALTERNATIVE STYLE.

consideration where ballast and loaded legs are generally unequal in length. The profit per day can be compared with that of the standard estimate and also with that expected from an alternative voyage which could be fixed for the vessel. Because a time charter could form a further alternative, it is usual for the profit per day from the voyage estimate to be converted to a time charter equivalent.

In general, voyage estimates are prepared for determining the best engagement for a vessel in the short term. Long-term commitments involving period hire or scrapping or laying up vessels are more a matter of policy and are more speculative in nature, decisions being based upon future expectations in the freight market.

Whether or not a particular charter is accepted in preference to another depends partly upon expected profit per day and partly upon factors which are less easily quantified, e.g.:

- (a) Position of ship at discharge in relation to future voyage prospects.
- (b) Type of cargo in relation to claims and damage to ship.
- (c) Drydock and repair commitments.
- (d) Crew repatriation.
- (e) Port congestion.
- (f) Possibility of strikes occurring.
- (g) Familiarity with trade and suitability of vessel for the cargo.
- (h) Previous cargo carried.
- (i) Total length of voyage.
- (j) State of the freight market.

The information required for working a voyage estimate consists of:

1. Vessel's cubic capacity and deadweight.
2. Speed.
3. Fuel consumption.
4. Running costs, updated frequently.
5. Maritime Atlas.
6. Table of Distances.
7. Load Line Zone chart.
8. Price list of bunker fuel.
9. Rates of exchange.
10. Rates of cargo handling in proposed ports of loading and discharging.
11. Canal dues and port charges.
12. Expected port disbursements.

Bunkering ports should be selected to gain maximum advantage from cheap fuel and to enable maximum cargo to be lifted. Sometimes a vessel will bunker at more than one port after loading in order to be able to lift a greater amount of cargo. The extra freight revenue has to be set off against the additional expense incurred in bunkering at additional ports. With short voyages, when freight rates are low it sometimes pays to lift extra fuel and shut out cargo to take advantage of favourable differentials in bunker oil prices.

The profit per day arrived at from the process of voyage estimating makes no allowance for depreciation which must be deducted before arriving at the net operating surplus (before tax).

Voyage estimate: Example

Bulk carrier, 24,000 dwt, 16 kts, on 40 tons marine fuel oil at sea and 2 tons per day in port with 1½ tons diesel oil per day throughout. Stores, including fresh water, 400 tons. Lies in Glasgow. November.

Two short-term fixtures are being considered: (a) a voyage charter with coal from Hampton Roads to Kobe and (b) a 3-month T/C @ \$6.00, 3%. Delivery Rosario and redelivery in the London/Hamburg/Havre range.

Voyage C/P terms: \$15. Gross load. Discharge free. 5 days all purposes Shine. Despatch \$500. 3½% Coal.

(a)	<u>Sea</u>	<u>Port</u>
Glasgow — Hampton Roads	9	2
Hampton Roads		2
Hampton Roads — Colon	4½	
Panama Canal transit		1
Balboa — Kobe	21	
Kobe	—	<u>3</u>
	34½ +	6 = 40½ say 41 days total.

Vessel to bunker in Balboa.

<u>Bunker stems</u>	<u>Fuel oil</u>	<u>Costs</u>
Glasgow — Balboa Steaming:	40 × 14 = 560	
Port:	3 × 2 = 6	
Spare:	<u>100</u>	
	666 @ \$85	56,610

<u>Diesel oil</u>		
Steaming		
and port:	1½ × 17 = 25	
Spare:	<u>100</u>	
	125 @ \$125	15,625

<u>Fuel oil</u>		
Balboa — Kobe Steaming:	40 × 21 = 840	
Port:	2 × 3 = <u>6</u>	
	846 @ \$75	63,450

<u>Diesel oil</u>		
Steaming and port:	1½ × 24 = 36 @ \$108	<u>3,888</u>
		Total \$ 139,573

Credit spare fuel on arrival:

Fuel oil: 100 tons @ \$ 75	\$ 7,500
Diesel: 64 " @ \$ 125	8,000
36 " @ \$ 108	<u>3,888</u>
	\$ 19,388
Brought fwd.	<u>139,573</u>
Net fuel costs	120,185

Voyage expenses

Running costs. 41 days @ \$1,631	66,871
Fuel.....	120,185
Port disbursements Hampton Roads	17,625
Loading. 22,710 tons @ 23½c per ton	5,337
Canal, including berthing Balboa	18,000

Port disbursements Kobe	10,575
Commission on freight	<u>11,922</u>
	\$ 250,515

Cargo to load

Summer deadweight	24,000	
Stores	400	
Fuel Balboa — Kobe	840	
Fuel (safety)	200	
Diesel	<u>36</u>	
	1,476	<u>1,476</u>
		22,524
Allowance for Tropics		<u>186</u>
Available for cargo		22,710 tons
Freight: 22,710 tons @ \$15		340,650
Total expenses		<u>250,515</u>
Gross surplus		\$ 90,135

Gross profit (surplus) per day = $\frac{90,135}{41} = \$2,198$

(b) Time charter. Delivery Rosario.

Steaming time. Glasgow — Rosario; 17 days

Fuel oil: $17 \times 40 = 680$ tons
 Diesel: $17 \times 1\frac{1}{2} = 25$ tons

Ballast expenses

Running costs. 17 days @ \$ 1,631 per day	\$ 27,727
Fuel oil: 680 tons @ \$ 85 per ton	57,800
Diesel oil: 25 tons @ \$ 125 per ton	3,125
Disbursements Rosario	<u>2,350</u>
Total	\$ 91,002
Charter hire: $24,000 \times 3 \times 6 =$	\$ 432,000
Commission 3%:	<u>12,960</u>
Net hire	419,040
Less ballast expenses:	<u>91,002</u>
	\$ 328,038

Effective rate per day = $\frac{328,038}{107} = \$ 3,066$

Hence gross profit per day = $3,066 - 1,631 = \$ 1,435$

This compares with \$ 2,198 estimated for the voyage charter which should be preferred.

'Standard' voyage estimate

Motor tanker 36,200 tons SDW.

Worldscale 100 Curacao — London = £1.50 per ton

From London to Curacao	4,202 miles
and Curacao to London	<u>4,202</u> miles
Total	8,404 miles

Bunker requirements

Miles per day 384 (@ 16 kts) Days at sea 22	Diesel oil per day Nil
	Fuel oil per day 56
Diesel oil tons at sea	Fuel oil tons at sea 1232
" tons in port 9	" tons in port 50
Total diesel oil tons 9	" pumping cargo 25
	Total fuel oil tons 1307

Bunker stems

	£	@ Worldscale 110
London 9 tons D.O. @ £9.67 per ton	87	Freight 57,304
London 654 tons F.O. @ £5.35 per ton	3,499	Comm. 1,432
Curacao 653 tons F.O. @ £5.25 per ton	<u>3,428</u>	55,872
Bunkers: Total	7,014	Exp. 24,981
Running expenses: Days at sea 22		30,891
Days in port 4		+ Comm. 1,302
Total days 26		Profit 32,193
26 days @ £540 per day	14,040	
Commissions 2½%	1,302	
Disbursements: Curacao	525	
London	2,100	

Canal dues: Ballast Loaded		
Unforeseen expenses:		Profit per day = £1,238
Miscellaneous:		Hence each 10 points W
Total expenses	24,981	= £1,238 - £1,043
Freight: 34,730 tons @ £1.50 per ton	52,095	= £195 per day
Estimated result: Profit	£27,114	Estimated profit per day £1,043

PROJECT APPRAISAL AND CHOICE USING DISCOUNTED CASH FLOW ANALYSIS*

These notes are about the use of discounted cash flow analysis in project appraisal and choice. I hope to clarify points that are sometimes hard to grasp and to suggest a number of rules and techniques that are useful in day-to-day work. John Evans covered some of the basic material in his talk, (pages 30-33), but for a more comprehensive treatment the reader should turn to one of the general works cited at the end of this paper. Of these, the shorter of the two by Merrett and Sykes (reference 1) should prove more than adequate for most purposes. The other references are specific to the use of analysis in shipping questions.

The method of discounted cash flow (DCF) aims to analyse the pattern of payments and receipts associated with a project over time and in assessing the balance of advantage or disadvantage to eliminate the effects of time by discounting. Its use allows us to answer three distinct kinds of question in project appraisal:

- (a) Should we undertake the project at all?
- (b) If there are alternatives, which should we choose?
- (c) When should we undertake it and is there advantage in attempting to influence the time profile of payments and receipts?

The following table, drawn from discount tables to be found in the general references, lists values of discount and annuity factors used in the discounting process. Examples in the text will draw on these factors, but any practitioner will need a full set of tables as his basic working tool. A discount factor represents to present value, the value today at a given rate of discount, of one unit of currency received or paid out at the end of each year listed in the left-hand column. An annuity factor is the present value also at a given discount rate of a stream of annual unit receipts or payments over a given number of years. The derivation of the factors is explained in John Evans' paper. The reader should make sure he understands why the annuity factor for a given number of year is equal to the sum of the discount factors for each year leading up to and including that year.

	<u>Discount factors</u>	<u>Annuity factors</u>
	Present value of unit payments (or receipts) <i>i</i> years hence.	Present value of unit payments (or receipts) at the end of each of <i>i</i> years hence.
	Rate of discount = 10 per cent	Rate of discount = 10 per cent
Year		
1	0.91	0.91
2	0.84	1.75
3	0.75	2.50

Suppose the cash flow, the pattern of payments and receipts to be associated with a project, has been identified. Each item is discounted to give its present value at the appropriate rate of discount. Payments are

given a negative sign and receipts are marked positive. The arithmetic sum of the "discounted cash flow" is taken to represent the "net present value" of the project.

The convenience of DCF appraisal is that the rate of discount embodies a yardstick against which project choice can be made. Suppose your organization is faced with opportunities such that it can be indifferent between a sum of \$7.5 million today and one of \$10 million in three years' time. A 10 per cent rate of discount becomes a summary of the advantage to be had from the best alternative opportunities in the sense that \$7.5 million is the present value of a sum of \$10 million in three years' time, when the rate of discount is 10 per cent. The statements about indifference and discounting at this particular rate are equivalent. We can summarize and compare different courses of action in terms of a criterion or "test rate of discount". The rate measures the "opportunity cost", the best alternative advantage we forgo, by considering the project in hand.

To illustrate the use of a discount rate as a criterion, suppose 10 per cent is the appropriate rate and consider the merits of a project involving a single expenditure of \$75 today yielding a single receipt of \$100 at the end of 2 years. As the discount factor at 10 per cent for a transaction at the end of 2 years is 0.84, the present value of the receipt will be \$84. The net present value of the project will therefore be \$88 - \$75 = \$13. Since this amount is positive, the investment is desirable in comparison with the best alternative opportunities open to us. Had the net present value been negative, we should have done better to reject the project and seek some other opportunity.

The general basis for DCF analysis should now be clear. Receipts and payments should be identified, signed and listed against the years in which they occur. They should then be discounted at the appropriate test discount rate and the net present value found by simple addition. A positive net present value (NPV) implies that discounted receipts exceed discounted payments and that, judged against our test discount rate, the project is desirable. This provides us with a simple investment rule: accept projects with a positive NPV, reject those with a negative NPV. A zero NPV implies indifference.

The principle is illustrated by the following example of a three-year project. Suppose that an initial commitment of \$150 with outgoings of \$40 at the end of each of the first two years and \$20 at the end of the final year yields a receipt of \$100 at the end of each

	<u>Receipts \$</u>		<u>Payments \$</u>	
Year	Actual	discounted	Actual	discounted
0			-150	-150
1	+100	+91	-40	-36.4
2	+100	+84	-40	-33.6
3	+100	+75	-20	-15.0
Present value		+250		-235.0
Net present value		+15		

* Mr. D.R. Coates, Department of Industry, London.

Year	Receipts \$	Payments \$	Net cash flow \$	Discount Factor	Discounted cash flow \$
(1)	(2)	(3)	(4) = (2) — (3)	(5)	(6) = (5) × (4)
0		-150	-150	1	-150
1	+100	-40	+60	0.91	+54.6
2	+100	-40	+60	0.84	+50.4
3	+100	-20	+80	0.75	+60.0
Net present value					+15

year. The initial payment is made immediately and is not, therefore, subject to discounting. The other sums are discounted in the usual way. Discount factors for periods other than whole years may be obtained by interpolation in the annual tables, but such sophistication is not generally required since the errors involved will almost certainly be less than those involved in estimating the cash flow.

The reader may prefer to set out his calculation in the following alternative way. He is strongly encouraged to make quite sure he has understood thus far before he embarks on the passages that follow. They assume and depend on his understanding.

Public and private sector appraisal

I should say more about the rate of discount and distinguish between appraisal from the point of view of a government or state corporation and that of a private sector company. In neither case is the rate of discount a rate of interest as paid to a financial institution. To begin with, the rate of discount is not simply a return to financial assets but also one to the skills of those in the organization and the physical capital they use valued as closely as possible on the basis of alternative use. Secondly, the value of a financial rate of interest will always reflect current and expected future rates of inflation, whereas a rate of discount should be a real rate of return abstracted from changes in the value of money. This means that all the payments and receipts in a cash flow should be expressed in terms of the price levels of a single year so that the only price changes to be incorporated in DCF analysis are those expected in prices relative to one another, say increases in commodity prices relative to manufactured goods and changes in relative prices as affected by changes in exchange rates. The main relative price shift on the cost side in shipping work is likely to be between labour and all other quantities, with the real cost of labour inflating gradually relative to the others. The treatment of inflation and exchange rate changes is shown in a later section. None of this, of course, is to ignore the variation in a ship's income through time as a result of fluctuations in the market for shipping services. Such variation is reflected in freight rates and load factors, the prediction of which often presents the most serious of practical difficulties in shipping appraisal work.

As regards the distinction between appraisal from the private and public point of view, the former is generally attempted post-tax to take full allowance of

grants, tax concessions and of loans made available at preferential rates. The analysis is still concerned only with receipts and payments in the cash flow so that accounting transfers within a company, such as for depreciation, are irrelevant unless relevant allowances are to be deducted from tax payments included in the cash flow as a result. Thus, a 30 per cent depreciation allowance for a payment of \$100 in a given year will reduce tax liability by \$30 and reduce the appropriate payment from the cash flow. The rate of discount will clearly reflect the balance of private considerations as they affect the company.

Appraisal from the point of view of a government or public corporation should be primarily concerned with payments and receipts for real goods and services and not with financial transfers between residents in the same country and its Government. Thus, interest charges paid overseas should be included for the payment represents a potential claim on domestic resources, but taxes, tax code concessions and internal interest payments should generally be ignored in public sector appraisal. The essential difference is that public sector appraisal should be made from the point of view of the economy as a whole, rather than from that of the private interest.

There are two further aspects. The first is that the rate of discount should represent what is called the "long-run social opportunity cost" of the proposed investment, which implies comparison of the project with opportunities throughout the economy, taking a run of years together and not just those facing a particular organization at a given point in time. Second, as the rate will also be pre-tax, it may well be higher than the rate appropriate to private sector post-tax appraisal depending on the form of tax concessions and the ability of companies to take advantage of them. In the United Kingdom, the social opportunity cost real rate of discount is currently set at 10 per cent for public sector investment. The guidance is that this is the rate for low-risk projects; increasing the rate to reflect higher risk is an arbitrary way of introducing a treatment of risk into discounted cash flow appraisal work. Another, which I prefer, is suggested in a later section. The whole subject of the fiscal treatment of shipping in the United Kingdom, which bears on the difference between pre-tax and post-tax rates of discount, is too complex to be summarized here. The interested reader is referred to the paper by Gardner and Richardson.^{1/}

^{1/} "The fiscal treatment of shipping", *Journal of Industrial Economics*, December 1973.

Another important difference between private and public sector analysis is that, whereas a private concern will always adopt the prices it faces for goods and services, a state concern may correctly price items at "shadow prices" rather than the prices they happen to command in the market place. Thus, if there is a considerable degree of unemployment so that a project does not simply have the effect of displacing labour from other occupations in the economy, the correct cost for labour may be lower than the wages paid. Such a treatment will clearly favour relatively labour-intensive projects among any particular portfolio of choices. It is difficult, however, to give general guidance as to the shadow price of labour without knowledge of particular conditions, but, if ships' crew are to be recruited from areas of fairly high unemployment, a shadow price as low as one-half times the wages paid might not be inappropriate.

A second occasion for the use of shadow pricing may be presented if a country with fixed exchange rates is likely to face persistent balance of payments difficulties over the life of a project. In this case, it may be possible to justify a shadow price for foreign exchange insofar as the domestic economy would have to be managed at a lower rate of activity had it not been for the net foreign exchange receipts realized by the project. A country with persistent difficulties might value foreign exchange receipts and payments at 1.2 or 1.5 times their nominal value, but, just as in the case of shadow wages, a shadow price for foreign exchange is really a matter for a professional economist to apply his mind to in the circumstances of each particular country. Another way of dealing with a preference for foreign exchange is to calculate the shadow price that would be required to give projects that have already been chosen and have apparent negative net present values to reach a zero net present value. This is a method of imputing values on the basis of preferences revealed by those in authority.

The treatment of risk and uncertainty

Definitions of risk and uncertainty are many and there are several ways of taking them into account in discounted cash flow analysis. I shall suggest one which I have found useful in practice.

A practical distinction between uncertainty and risk is to take uncertainty as meaning an absence of knowledge and risk as reflecting the risk at which an organization might put itself if an uncertain situation is misjudged.

The way I favour for dealing with uncertainty is to estimate the net present value of each of the outcomes that a project might result in, depending upon combinations of the uncertainties as they stand. I then weigh the different net present values together, using numerical weights that sum to unity and which reflect the relative likelihood of the different outcomes given the uncertainties as I judge them. For example, suppose uncertainties about freight rates are such that a given project could have a net present value of \$4 million, \$2 million, 0 or -\$5 million respectively. If each is equally plausible, so that numerical weights of 0.25 are attached to each, the

"expected NPV" is positive. But if the latter two sums are more likely than the former with relative weights of 0.3, 0.3, 0.2 and 0.2, respectively the "expected NPV" becomes negative. On the normal investment rule, the project would be acceptable on the first set of circumstances but would be rejected on the latter. The figuring is shown below.

Outcome	NPV	Example 1		Example 2	
		Relative weight	NPV × Weight	Relative weight	NPV × Weight
A	4	0.25	1	0.2	0.8
B	2	0.25	0.5	0.2	0.4
C	0	0.25	0.0	0.3	0.0
D	-5	0.25	-1.25	0.3	-1.5
Expected net present value			+ 0.25	- 0.3	

Whereas a large and diversified organization might be able to accept the risk of outcomes with a negative NPV, a smaller, private or undiversified operation might not. Although they are obviously difficult to judge in quantitative terms, such attitudes to risk can be introduced into the analysis by biasing the weights reflecting uncertainty. The method is to choose weights reflecting risk which average to unity so that, when the uncertainty weights and risk weights are combined by multiplication and are subsequently added, they still sum to unity. An organization that is highly risk-averse might choose weights of, say, 1.5 to possible outcomes with negative NPVs and weights below unity to outcomes with a positive or zero NPV. The result of introducing this kind of bias to the first uncertainty example is shown below. The reader will see that its effect is to turn a positive and acceptable expected NPV into a negative and unacceptable result.

Outcome	NPV	Relative weight for uncertainty	Relative weight for risk	Combined weight	NPV × Combined weight
A	4	0.25	0.8	0.2	0.8
B	2	0.25	0.8	0.2	0.4
C	0	0.25	0.8	0.2	0.0
D	-5	0.25	1.6	0.4	2.0
Expected net present value =					-0.8

Preferential loans, inflation and rates of exchange^{2/}

We have already noted the availability of preferential loans for shipping. This section consists in a simple demonstration of the effect of preferential interest rates, rates of inflation and exchange on the present value of an illustrative project.

To begin with, it is useful to see that, in a non-inflationary world, a loan at a rate of interest equal to the rate of discount yields a zero net present value:

^{2/} Ready-reckoners for making calculations of this type together with the formulae employed are to be found in appendix 1 of *The Economies of Size in Dry Bulk Carriers* by R.O. Goss and C.D. Jones, No. 2 in the series of Government Economic Service Occasional Papers, HMSO, London, 1971. A simple computer programme could be used to extend them.

\$100 borrowed for 3 years at 10 per cent
Rate of discount = 10 per cent

Year	0	1	2	3
Payments		-10	-10	-110
Receipts	+100			
Discounted	+100	-9.1	-8.4	-82.5
Net present value	0			

In the same circumstances, if the loan was obtainable at 7 per cent but the discount rate was still 10 per cent, borrowing would yield a positive net present value:

\$100 borrowed for 3 years at 7 per cent
Rate of discount = 10 per cent

Year	0	1	2	3
Payments		-7	-7	-107
Receipts	+100			
Discounted	+100	-6.4	-5.9	-80.3
Net present value	+7.4			

In an inflationary world, the cash flows must first be deflated, but the use of the deflator can be combined with the rate of discount in discounting for $(1+m)(1+n)^t \sim (1+m+n)^t$. If the rate of discount has been correctly assessed in real terms and happens to be 10 per cent and the rate of inflation is 5 per cent, we discount at 15 per cent. If the rate of interest is 7 per cent in money terms, the increased advantage of borrowing in these kinds of conditions is shown by comparing the present value in the present case with that shown immediately above.

\$100 borrowed for 3 years at 7 per cent
Rate of discount = 10 per cent (in real terms)
Rate of inflation = 5 per cent
Discounting at 15 per cent

Year	0	1	2	3
Payments		-7	-7	-107
Receipts	+100			
Discounted	+100	-6.1	-5.3	-70.4
Net present value (in real terms)	+18.2			

Notice that the high net present value in this example results from the lower real rate of interest assumed (2 per cent as compared with 7 per cent in the previous example), not from higher cash flows generated by the investment. This kind of financial gain is very dependent on correct judgement of the relative levels of interest

rates and future inflation.

Now consider the effect when the home country is inflating more rapidly than the foreign country from which it is borrowing, but the effect is partly offset by the depreciation of the home currency against that of the creditor country. Suppose a 7 per cent loan is made with the relative rate of inflation to the advantage of ourselves being 5 per cent, somewhat compensated in its effect by an annual relative shift in exchange rate of 2 per cent. Again combining the rates of change into a single rate of discount we have:

\$100 borrowed for 3 years at 7 per cent
Rate of discount = 10 per cent (in real terms)
Rate of inflation = +5 per cent
Rate of exchange = -2 per cent
Discounting at 13 per cent

Year	0	1	2	3
Payments		-7	-7	-107
Receipts	+100			
Discounted	+100	-6.2	-5.5	-74.2
Net present value (in real terms)	+14.1			

Although a test rate of discount will normally be constant over the lifetime of a project, the expected path of differential inflation and exchange rates may exhibit rather less stability. The way to take this into account is to modify the combined discount factor year by year as seems appropriate.

Although there is often advantage in seeking loan finance, the availability of cheap credit for shipping in contrast to that available for certain other sectors should not be allowed to encourage untoward investment in shipping without careful appraisal of the various opportunities presented. It should never be forgotten that the general international availability of cheap finance has tended to depress freight rates and the apparent rates of return on shipping world-wide. Second, the fluctuation of freight rates may leave an undiversified enterprise at great risk in a severe downturn in trade or if there are reasons to suppose its competitiveness may suffer. I have already suggested how risk might be taken into account in analysis.

The comparisons of projects with a different life and choice given a budget constraint

So far we have been concerned with single projects judged against a discount rate representing the alternative opportunities facing an organization at the margin. The investment rule to accept a project if the net present value of the associated costs and returns is positive and to reject it if the net present value is negative has been illustrated. No mention of project life has yet been made, although this is important if two mutually exclusive projects with a different life are to be compared. Similarly, we have not dealt with the question

of project choice when an organization is faced with a budget constraint. Our discussion of these subjects will be followed by another of an exercise which was based to illustrate several of the points made in my talk to the ESCAP/DANIDA seminar.

Suppose we have a choice between two mutually exclusive projects. If their lives are the same, we choose the project with a higher net present value. But if their lives differ, we face a problem because direct comparison of net present values as such is no longer a valid criterion for choice. The simplest solution is to compare the net present value of each with the annuity factor at the test discount rate for the number of years forecast for its life and then to choose the project with the highest NPV: annuity factor ratio. The logic is that, within our means, we should attempt to choose the project that is relatively more rewarding over each year in its life. To understand this, remember that the annuity factor gives us the present value of a constant stream of payments or receipts of one unit of currency in each year of the period over which it is calculated. The higher the net present value of the project as compared with the annuity factor for unit net receipts over its life, the more valuable is its annual contribution to our organization.

As an example, compare a new ship with a 20-year potential life with a second-hand vessel that should last us 7 years. If the NPV of the longer-lived vessel is \$3 million and that of the shorter-lived \$2 million, as the appropriate annuity factors at 10 per cent for 20 and 7 years are 8.51 and 4.87 respectively, we should prefer the shorter-lived vessel for it has the higher NPV divided by annuity factor: 411,000 as compared with 352,000.

Now consider what we should do if we are faced with a budget constraint. If all our projects are of equal duration and the budget constraint is properly regarded as a constraint on capital cost, we should rank the projects by net present value divided by capital cost and select the portfolio yielding maximum present value over-all given the capital resources available to us. This rule would clearly produce the same results if all the projects were financed by 80 per cent loans at the same preferential rate of interest. But if different loan cover was available to projects, a more revealing method of ranking would be to use the ratio of NPV to the commitment of our own capital resources that is required for each vessel. Finally, for variously financed projects of different life under a budget constraint, ranking should be by NPV divided first by the appropriate annuity and then by our own commitment of capital. None of these rules can be described as exact, but they do provide us with an approach to the problem of choice under a budget constraint which is consistent with the logic of the situation.

Suppose as an example we have \$10 million available for investment in the current year and have four opportunities a, b, c and d open to us. The capital cost of each course is \$15 million and the present values have been assessed at \$25 million, \$20 million, \$15 million and \$10 million respectively. Since all the net present value estimates are positive, each project could enhance our position, although none is feasible without borrowing. If each vessel has a similar life and 80 per

cent loans are available, dividing the net present value estimates by figures of our own capital commitment of \$3 million per vessel produces the following ranking:

	a	b	c	d
(i) NPV \$m	25	20	15	10
(ii) Own capital commitment \$m	3	3	3	3
(iii) = (i) + (ii)	8.3	6.6	5	3.3

Given our budget constraint of \$10 million, we choose a, b and c costing a total of \$9 million and reject d.

Now suppose that, unlike borrowings for a, c and d, we cannot raise a 80 per cent loan on vessel b so that a \$7 million instead of a \$3 million contribution is required from our own resources. The ranking shifts as does the current choice: b is rejected. But even if b had been just acceptable, we might have thought carefully about risks because of our greater commitment.

	a	c	d	b
(i) NPV \$m	25	15	10	20
(ii) Own capital commitment \$m	3	3	3	7
(iii) = (i) + (ii)	8.3	5	3.3	2.9

Suppose further that the same difficulties in financing b remain, but that vessel a has a 20-year life, while b, c and d are second-hand with only 5 years to run. We divide the net present values first by the appropriate annuities at the test discount rate and then by our own capital commitment. The order of preference changes, but b is still rejected given a budget constraint of \$10 million.

	c	a	d	b
(i) NPV \$m	15	25	10	20
(ii) Annuities at 10 per cent	3.8	8.5	3.8	3.8
(iii) Own capital commitment	3	3	3	3
(iv) = (i) + (ii) + (iii)	1.3	0.98	0.88	0.75

Exercise

The exercise at annex I illustrates a number of points in my talk and was attempted by those who attended the course. It gives information about the prospects for four vessels, A, B, C and D, and seeks advice as to purchase with and without capital constraints. Annex II consists of worked figures at discount rates of 8, 10 and 12 per cent. The reader will notice

the use of annuity values quoted at foot-note 3 to table 1 and the present value of loans quoted in table 2. The latter could have been derived from calculations similar in principle to those indicated in the third paragraph of the preceding section. Annex III is a note on the exercise.

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General

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3. A.J. Merrett and A. Sykes, *The Finance and Analysis of Capital Projects*, 2nd ed., (London, Longmans, 1974).

Specific

4. I.L. Buxton, *Engineering Economics and Ship Design* (Newcastle, British Ship Research Association, 1971).
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ANNEX I

EXERCISE IN INVESTMENT APPRAISAL

You are invited to constitute yourselves the management of a substantial shipping company based in a developing country. Your fleet of 12 ships of various types and sizes are trading at reasonable levels of profit. The two oldest ships are expected to become unprofitable next year and you then plan to sell them for scrap at about US\$ 1 million each.

Your shareholders, a mixture of public and private sector institutions, all located in your own country, have further funds available for investment in profitable shipping activities, within their over-all policy of encouraging you to build up your fleet for profitable trading in the world market. You have no tax liabilities for the foreseeable future and ample crews available for new ships.

A preliminary sifting of ideas has produced the

This exercise is based upon that developed by R.O. Goss and H. Sohm for the ECAFE Training Course on the Management of Tramps, Tankers and Purpose-built tonnage, Singapore, May 1972. Due acknowledgement is given.

projects described in table 1 for detailed consideration. All are for new ships of proven designs obtainable from reputable shipyards.

You are invited to select the discount rate most appropriate to conditions in the countries represented in your syndicate and to advise which projects to undertake:

- (a) If there is no capital constraint;
- (b) If capital is limited to \$8.50 million;
- (c) If capital is limited to \$15.25 million.

The information in table 2 may be helpful.

ANNEX III

The calculations show that, in the absence of budget constraint and whatever the correct discount rate, all the vessels have a positive net value and should be bought.

As to choice under a budget constraint, the following figuring covers the 8 per cent rate of discount case. As the reader might expect, in view of the relative order of the rates of interest and discount, the present value of each project is increased by taking advantage of the loan. Ranking by net present value divided by capital costs or by own capital costs suggests that A is preferred to B, B to D, and D to C as is shown below:

	A	B	D	C
(i) NPV \$m	10.65	20.44	4.82	14.26
(ii) Own capital cost \$m	6.8	6.8	1.9	6.4
(iii) = (i) + (ii)	3.04	3.01	2.54	2.23

With a budget constraint of \$15.25 million, the choice before us is A and B or A with both C and D. Not only does the ranking suggest the former combination is preferable, but the net present value of the former is \$41.1 million as compared with \$39.7 million for the latter.

Given the lower budget constraint of \$8.5 million, we can choose A or B or C and D. A is clearly to be preferred to B for the ranking index of net present value divided by our own capital commitment is greater. The net present value of A at \$20.5 is also greater than C and D at \$19.1 million and, as the ranking suggests, is to be preferred. The reader may wonder why C and D, which use a greater proportion of capital available to us, should not in some sense be preferred to A, which leaves a larger proportion unused. We already know that the present value of A exceeds that of C and D, and a moment's thought should show that the present value of unused capital resource is equal to itself. In practical situations, an organization would need to consider how far it should take up opportunities to borrow, especially at preferential rates. The basis for such an exercise is set out in the section "Preferential loans, inflation and rates of exchange" above.

TABLE I.

Ship	A	B	C	D	
					Gearless bulk carrier (Pamamax)
Dwt	Tanker	Tanker	Tanker	65,000	tons
Speed	250,000	250,000	220,000	15.5	knots
Fuel consumption	16.25	16.25	16.5	60	tons HVF per day
	180	180	175		
Capital cost	34	34	32	9.5	US\$ mn.
Running cost (T/C basis)	2.65	2.65	2.5	0.8	US\$ mn. per annum
T/C rate	2.8354	2.8354	2.8272	3.0	US\$ per dwt ton per month
Earnings	8.151775	8.151775	7.152816	2.242500	US\$ mn. p. a. on 11½ months in service
Loan terms		combined			
% of capital cost	80	50	30	80	80
Period	8	6	8	8	8
Rate of interest	7	6	8	7	7
Fees	1%	1.45%	1.45%	1%	1%
		+ 1/16th% mgnt. fee on outstanding balance			

- Notes:**
1. The earnings may be considered to continue for an estimated ship life of 20 years.
 2. Inflation may be ignored.
 3. The 20-year flat annuity factor is 9.818 at 8 per cent, 8.514 at 10 per cent and 7.469 at 12 per cent.
 4. On the terms specified, the present value of a US\$1 million loan is shown in table 2.

**TABLE 2. PRESENT VALUES OF US\$1 MILLION
LOANS AT VARIOUS DISCOUNT RATES AND TERMS**

Present value (million US\$)

Discount rate	Terms as for ship				
	A	B(50%)	B(30%)	C	D
8	0.976	0.963	1.019	0.976	0.976
10	0.913	0.913	0.954	0.913	0.913
12	0.857	0.867	0.896	0.857	0.857

ANNEX II

SYNDICATE EXERCISE ON INVESTMENT APPRAISAL WORKINGS AND ANSWERS WITH 8 PER CENT DISCOUNT RATE

Ship	A	B	C	D
Revenue — costs	8.15 — 2.65 = 5.50		7.15 — 2.5 = 4.65	2.24 — 0.8 = 1.44
P.V. of cash flow	5.50 × 9.818 = 54.0	As for ship A	4.65 × 9.818 = 45.65	1.44 × 9.818 = 14.11
P.V. with outright purchase	54.00 — 34.00 = 20.0		45.65 — 32.0 = 13.65	14.14 — 9.5 = 4.64
Loan terms				
Size of loan	0.8 × 34 = 27.2	0.5 × 34 = 17	0.3 × 34 = 10.2	0.8 × 32 = 25.6
Down payment	34 — 27.2 = 6.8	34 — (17 + 10.2) = 6.8	32 — 25.6 = 6.4	0.8 × 9.5 = 7.6
P.V. of US\$1 million loan	0.976	0.963	1.019	0.976
P.V. of loan	27.2 × 0.976 = 26.55	17 × 0.963 = 16.37	10.2 × 1.019 = 10.39	25.6 × 0.976 = 24.99
P.V. of capital cost with loan	6.8 + 26.55 = 33.35	6.8 + 16.37 × 10.39 = 33.56	6.4 + 24.99 = 31.39	7.6 × 0.976 = 7.42
P.V. of ship with loan	54.00 — 33.35 = 20.65	54.00 — 33.56 = 20.44	45.65 — 31.39 = 14.26	14.14 — 9.32 = 4.82

SYNDICATE EXERCISE ON INVESTMENT APPRAISAL WORKINGS AND ANSWERS WITH 10 PER CENT DISCOUNT RATE

Ship	A	B	C	D
Revenue — costs	8.15 — 2.65 = 5.50		7.15 — 2.5 = 4.65	2.24 — 0.8 = 1.44
P.V. of cash flow	5.50 × 8.514 = 46.83	As for ship A	4.65 × 8.514 = 39.59	1.44 × 8.514 = 12.26
P.V. with outright purchase	46.83 — 34.0 = 12.83		39.59 — 32.0 = 7.59	12.26 — 9.5 = 2.76
Loan terms				
Size of loan	0.8 × 34 = 27.2	0.5 × 34 = 17	0.3 × 34 = 10.2	0.8 × 32 = 25.6
Down payment	34 — 27.2 = 6.8	34 — (17 + 10.2) = 6.8	32 — 25.6 = 6.4	0.8 × 9.5 = 7.6
P.V. of US\$1 million loan	0.913	0.913	0.954	0.913
P.V. of loan	27.2 × 0.913 = 24.83	17 × 0.913 = 15.52	10.2 × 0.954 = 9.73	25.6 × 0.913 = 23.37
P.V. of capital cost with loan	6.8 + 24.83 = 31.63	6.8 + 15.52 + 9.73 = 32.05	6.4 + 23.37 = 29.77	7.6 × 0.913 = 6.94
P.V. of ship with loan	46.83 — 31.63 = 15.2	46.83 — 32.05 = 14.78	39.59 — 29.77 = 9.82	1.9 + 6.94 = 8.84

SYNDICATE EXERCISE ON INVESTMENT APPRAISAL WORKINGS AND ANSWERS WITH 12 PER CENT DISCOUNT RATE

Ship	A	B	C	D
Revenue — costs	8.15 — 2.65 = 5.50		7.15 — 2.5 = 4.65	2.24 — 0.8 = 1.44
P.V. of cash flow	5.50 × 7.469 = 41.08	As for ship A	4.65 × 7.469 = 34.73	1.44 × 7.469 = 10.76
P.V. with outright purchase	41.08 — 34.0 = 7.08		34.73 — 32.0 = 2.73	10.76 — 9.5 = 1.26
Loan terms				
Size of loan	0.8 × 34 = 27.2	0.5 × 34 = 17	0.3 × 34 = 10.2	0.8 × 32 = 25.6
Down payment	34 — 27.2 = 6.8	34 — (17 + 10.2) = 6.8	32 — 25.6 = 6.4	0.8 × 9.5 = 7.6
P.V. of US\$1 million loan	0.857	0.867	0.896	0.857
P.V. of loan	27.2 × 0.857 = 23.31	17 × 0.867 = 14.74	10.2 × 0.896 = 9.14	25.6 × 0.857 = 21.94
P.V. of capital cost with loan	6.8 + 23.31 = 30.11	6.8 + 14.74 + 9.14 = 30.68	6.4 + 21.94 = 28.34	7.6 × 0.857 = 6.51
P.V. of ship with loan	41.08 — 30.11 = 10.97	41.08 — 30.68 = 10.40	34.73 — 28.34 = 6.39	1.9 + 6.51 = 8.41

INVESTMENT APPRAISAL*

Discounted cash flows

Principles. *Compounding* sets out to determine the extent to which a given sum of money invested now will accumulate at compound interest up to the end of a given year. The formula is $A = P(1 + r)^n$, where P is the amount invested, at a rate of interest r for n years, and A is the accumulated sum. Thus, if £100 is invested for 9 years at 8%

$$\begin{aligned} A &= 100(1 + .08)^9 \\ &= 100 \times 2 = £200 \end{aligned}$$

Discounting is the inverse process and sets out to determine the present value of a sum of money to be paid or received at a future date.

Clearly, if £100 invested now is worth £200 in 9 years at 8% then it is true to say that £200 to be received in 9 years' time has a present value (P.V.) of £100.

The factor (in this case 0.5) by which a future sum of money must be multiplied to give its present value is called a discount (or present worth) factor being equal to

$$\frac{1}{(1 + r)^n}$$

The discount rate is to be regarded as the interest rate or required rate of return on capital which may or may not take inflation into account. More will be said about this later.

Discounting is commonplace in the world of banking where for example a customer may have a Bill of Exchange for £600 maturing in 6 months' time. A bank will usually discount the Bill by offering a smaller sum to the customer at the present time. The difference represents the interest which could be obtained if the amount paid to the customer was invested for 6 months at the given rate of interest. If this rate is 10%, then the bank will probably discount the Bill for

$$\begin{aligned} &600 \times (1 + 0.1)^{-0.5} \\ &= 600 \times .953 \\ &= £571.80 \end{aligned}$$

It is important to bear in mind therefore that cash has a time value, so that it is not just the returns on an investment which are important but the years in which they occur.

Investment appraisal

Investment appraisal is concerned with assessing whether or not a capital investment project is likely to produce worth-while returns and also with providing some yardsticks or criteria against which returns can be assessed.

The simplest kind of investment appraisal may be a case involving automation, such as the fitting of an automatic pilot on board ship. The savings resulting from a reduction in crew or their release for other work can be

compared with the capital cost of fitting the automatic pilot. This is a relatively simple case because the savings can be measured to a reasonable degree of accuracy. When an investment in a ship is to be considered, the revenue (except on a long time charter) may be difficult to establish as may be the costs of operation over a period of 15-20 years. Under these circumstances, there is bound to be a considerable element of risk, but, by using pessimistic, normal and optimistic estimates with appropriate weighting, there is a better chance of making the correct decision. Whatever the method of investment appraisal chosen, it is always the management or Board who must ultimately make the decision. Because the decision must take many other factors into account, the decision on whether or not to proceed with an investment may or may not be in line with that indicated by the results of the appraisal.

When it is difficult to establish the savings or revenues accruing from a capital investment, appraisal techniques can still be used successfully for the purpose of choosing between two types of machine where one may have a higher initial cost and low maintenance and the other may have quite different characteristics. An example given by I.L. Buxton in "Engineering Economics and Ship Design" that involves the comparison of two bulk carriers, one of which is self-unloading, is of this kind. In this situation, it is not very important whether crew, maintenance, insurance costs etc. are estimated very accurately, since any differences will in general affect one ship in the same way as the other.

Most investment appraisals involve cases where an initial capital expenditure is incurred and this expenditure recovered over a number of years together with interest and profit. There are cases however where an expenditure may be made by a Government, either directly or by way of a grant, and this expenditure is not expected to produce any cash returns from which an appraisal can be made. Examples include the construction of roads and bridges, for the use of which charges are not directly made; one could consider also investment in a port, the prime purpose of which is to reduce congestion and delays at the port. Since, in the short term at least, the port authority is unlikely to see any returns from the investment, another approach must be used. This is the social cost-benefit analysis which in this case would attempt to measure the benefits accruing to a country in terms of time saved or the reduction in costs of transport resulting from the berthing of larger vessels.

Methods of investment appraisal

The payback period. This is the number of years required to cover the cost of the project, ignoring depreciation, sometimes calculated before, and sometimes after tax. No account is taken of the earning life of the investment or the time value of money.

Return on capital. This is usually defined as the expected profit after allowing for depreciation but before

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tax as a percentage of the investment. Sometimes, the peak profit and sometimes the average profit is taken. Sometimes the initial investment is used, sometimes the average. There is the added ambiguity that the investment may be before or after deducting the investment grant. There are many difficulties, including the allowance of grants, investment and depreciation allowances; no specific account is taken of the earning life of the investment or the time value of money.

Net present value. This is a fully discounting method which takes into account the time value of money, investment grants and allowances as appropriate and sets out to compare the present value of earnings (after deducting direct costs and taxes) over the whole life of the project, with the initial capital outlay.

For example, a project has an initial capital cost of £14,440 and the net cash flows over the 5-year life of the project are estimated as follow:

Year	Cash flow	Discount factor	Discounted cash flow
1	4,000	.935	3,740
2	4,000	.873	3,492
3	4,000	.816	3,264
4	4,000	.763	3,052
5	4,000	.713	2,852
	<u>20,000</u>		<u>16,400</u>

The net present value (NPV) of the project is 16,400 – 14,440 = £1,960. The basic investment criterion is whether the NPV is positive or negative. If it is positive, then in general the investment should be made; if negative it should be rejected.

The NPV is given in general terms by the expression:—

$$NPV = \sum_{i=1}^n A_i(1+r)^{-i} - C_0$$

Where A_i is the expected cash flow in year i , r is the discount rate, n is the expected life of the project in years and C_0 is the initial capital cost of the project in year 0. Year 0 is the base year which is the beginning of year 1. Although cash flows are often generated uniformly throughout the year, the method assumes, without significant error, that all cash flows occur at the end of the year.

The NPV automatically takes into account the life of a project, depreciation and interest.

Where the cash flows are uniform, as in the example given, it is evident that the present value of the total cash flows is equal to the product of cash flow in any year and the sum of the discount factors. The sum of the discount factors is given in annuity tables, being 'uniform present worth factor' or 'annuity factor'.

$$\text{Annuity factor} = \frac{1 - (1+r)^{-n}}{r}$$

Now, when $n = 5$ and $r = .07$, the annuity factor = 4.100

This leads to a short cut in obtaining the present value of cash flows in the previous example. P.V. = 4,000 × 4.100 = £16,400 as before.

Capital recovery factor. This is simply the reciprocal of the annuity factor

$$C.R.F. = \frac{r}{1 - (1+r)^{-n}}$$

The discount rate. This is determined by the cost of capital to the firm. There are several main sources of capital.

- Share or equity capital;
- Retained earnings;
- Rights issues;
- Debentures or other loan capital (Interest free of tax).

These sources of capital all have different costs because of the tax element and because of the degree of risk. Also, the loan capital may be subsidized. The project may be financed by a mixture of these sources and the discount rate weighted accordingly.

Inflation. In situations where revenues can be adjusted to take into account increased costs, provided both increase at the same rate, there is no need to allow for inflation. Where costs only are expected to increase, these should be allowed for in the calculations, thereby giving a declining net revenue profile. The fall in the value of money resulting from inflation assumed at k per year can be allowed for by multiplying the net cash flow in year i by the factor $(1+k)^{-i}$

$$\begin{aligned} \text{Thus, the present value of } A_i &= A_i(1+k)^{-i}(1+r)^{-i} \\ &= A_i(1+k+r+rk)^{-i} \end{aligned}$$

If k and r are both small, the term rk can be ignored, so that

$$PV = A_i(1+(k+r))^{-i}$$

Capital rationing. If there is an unlimited source of capital, all projects that pass the basic test should be undertaken. Under capital rationing, those projects which give the highest ratio of NPV to capital investment should be given priority, bearing in mind the need to make the greatest total use out of the capital available.

DCF method or internal rate of return (IRR)

This method of investment appraisal is similar in principle to the NPV method, although a slightly different approach is used. Trial and error methods are used to find that discount rate which gives an NPV = 0. This discount rate is known as the DCF rate of return or the internal rate of return. The investment criterion used is that, provided the IRR is greater than the cost of capital (the cut-off rate), the project should be undertaken.

It is important to understand that the DCF rate of return represents the maximum rate at which capital could be borrowed for the purpose of the investment, and only then on the assumption that the capital can be freely repaid. Alternatively, the rate of return can be regarded as the rate of return earned on the unrecovered part of

the capital investment at any time.

Example. Capital of £1,000 is borrowed for the purpose of financing an investment with a life of 5 years. The cash flows (net) in the five years are respectively estimated as: £300, £200, £300, £400, £102. Find the maximum rate at which the capital could be borrowed, i.e. the IRR of the project.

Year	Cash flow £	D.F. 8%	D.C.F. £	D.F. 12%	D.C.F. £	D.F. 10%	D.C.F. £
1	300	.93	279	.89	267	.91	273
2	200	.86	172	.80	160	.83	165
3	300	.80	240	.71	213	.75	225
4	400	.74	296	.64	256	.68	273
5	102	.68	69	.57	58	.62	64
	<u>£1,302</u>		<u>£1,056</u>		<u>£954</u>		<u>£1,000</u>

At discount rate 8% NPV = £56.

At discount rate 12% NPV = £-46

At discount rate 10% NPV = 0.

Hence IRR = 10%

The IRR method gives a yield which takes no account of the life of a project nor does it take account of the amount of capital invested. Hence, it is of no use for ranking projects.

Another problem which may occur with the IRR method is that there may be more than one rate which gives a NPV = 0. This is only likely to occur when there are heavy cash outflows towards the end of a project's life. Under these circumstances, the rate of return is meaningless.

Comparison of NPV and IRR methods

Project	Capital cost	Ann. cash flow	Life	NPV @ 8%	IRR
A	502,000	100,000	10y	169,000	15%
B	780,000	144,000	10y	186,250	13%
B-A	278,000	44,000	10y	17,250	9.6%

Hence, project B provides all the returns of A, together with additional investment of £278,000, giving a NPV of £17,250 @ 8% or an IRR of 9.6%.

Of the four investment appraisal methods considered, the NPV is the one which is generally preferred as satisfying all problems and ranking criteria. On the other hand, there is nothing to prevent the use of other methods in addition, e.g. the pay back period which provides useful information. A useful approach which can be made is that of constructing a graph of NPV against time in order to find out when the capital investment will be paid back in present value terms. Sensitivity tests can also be carried out to see how critical the various assumptions are in the analysis.

Investment Appraisal: A Case Study

A new bulk carrier is to be financed partly by a firm's internal resources (30%) and partly by shipyard credit (70% repayable in annual instalments together with interest over 7 years @ 8%). The required rate of return is 8% together with 7% to allow for inflation. Free depreciation is allowed and corporation tax @ 50% is payable. An offer to time charter the vessel @ £3.34 per

dwt per month has been made. Assess the value of this proposal and also find the rate necessary to cover total costs. (15 years)

The following information is given:

Summer deadweight: 24,000

Initial Cost: £5,000,000

Scrap value: £500,000
after 15 years

Present running costs:

Crew £120,000

Stores £31,000

M & R £24,000

Insurance £50,000

General £12,000

Special Survey £6,000

Total running costs: £243,000 per annum

It is to be assumed that all running costs will increase at an average rate of 5% per annum.

N.B. Since this is a time charter, the charterer is responsible for fuel, port and cargo-handling charges.

A full DCF calculation gives a NPV of £934,990 and therefore at this rate of charter hire the offer would be rejected.

The problem now is to find the rate which will yield a NPV = 0. This rate would then be the minimum acceptable rate in order to cover total costs over a 15-year period. There is no simple solution and iteration is required. However, the full calculation need not be repeated. What we need to know is what increase in annual charter hire will reduce the NPV of -£934,990 to zero.

Suppose that the charter hire is increased by £234,200 per annum. This will have the effect of (1) increasing the cash flow and also the capital allowances by £234,200 in the early years, in fact until the full capital allowance of £5,000,000 has all been used up and (2) increasing the cash flow by £234,000 less tax @ 50% in the later years.

The effect of the increased charter hire can be dealt with by compounding (1) the present value of the cash flow arising from the change in capital allowances and (2) the present value of the increased cash flow after tax.

In years 1-7 inclusive, the capital allowance is increased by £234,000 per annum, giving a present value of:

$$£234,000 \times 4.1604 = £974,365$$

In years 8, 9, 10 the capital allowances are reduced as follows:

Year 10	£505,054	having a present value	£124,748
Year 9	£562,579	"	£159,772
Year 8	£571,767	"	£186,963
			<u>£471,487</u>

This yields an increase in present value of capital allowance

$$= £974,365 - £471,487$$

$$= £502,878$$

The saving in tax as a result of this increase

$$= £502,878 \times 50\% = £251,439$$

Present value of increased charter hire before tax:

$$= £234,200 \times 5.84737 \text{ (annuity factor 15 years @ 15\%)}$$

$$= \text{£}1,369,454$$

After tax

$$= \text{£}1,369,454 \times (1 - 0.5) = \text{£}684,727$$

Hence NPV is improved by $\text{£}251,439 + \text{£}684,727$

$$= \text{£}936,166$$

Previous NPV

$$- \text{£}934,990$$

New NPV

$$= \text{£}1,176 \text{ corresponding to a charter hire of}$$

$$\text{£}921,600 + \text{£}234,200 = \text{£}1,155,800 \text{ per annum}$$

$$\text{Rate per dwt per month} = \frac{1,155,800}{24,000} = \text{£}4.18$$

$$24,000 \times 11.5$$

Year	Capital	Interest	Cost	Charter hire	Tax profits	Capital allowance	Tax @ 50%	Cash flow	D.F. @ 15%	DCF
0	1,500,000							(1,500,000)	1.000	(1,500,000)
1	500,000	280,000	243,000	921,600	383,600	398,600	—	(101,400)	.870	(88,218)
2	500,000	240,000	255,150	921,600	426,450	426,450	—	(73,550)	.756	(55,604)
3	500,000	200,000	267,908	921,600	453,692	453,692	—	(46,308)	.658	(30,471)
4	500,000	160,000	281,303	921,600	480,297	480,297	—	(19,703)	.572	(11,270)
5	500,000	120,000	295,368	921,600	506,232	506,232	—	6,232	.497	3,097
6	500,000	80,000	310,136	921,600	531,464	531,464	—	31,464	.432	13,592
7	500,000	40,000	325,643	921,600	555,957	555,957	—	55,957	.376	21,040
8			341,925	921,600	579,675	579,675	—	579,675	.327	189,554
9			359,021	921,600	562,579	562,579	—	562,579	.284	159,772
10			376,972	921,600	544,628	505,054	19,787	524,841	.247	129,635
11			395,821	921,600	525,779		262,890	262,889	.215	56,521
12			415,612	921,600	505,988		252,994	252,994	.187	47,310
13			436,393	921,600	485,207		242,604	242,603	.163	39,544
14			458,213	921,600	463,387		231,694	231,693	.141	32,669
15	(500,000)		481,124	921,600	440,476	(500,000)	470,238	470,238	.123	57,839
	4,500,000	1,120,000	5,243,589	13,824,000	7,460,011	4,500,000	1,480,207	1,480,204		-934,990

THE COST OF SHIPS' TIME*

This talk described the methods used and main results obtained in an exercise completed in the UK Department of Trade and Industry in 1973. As a full account is available in published form,^{1/} these notes will explain the approach but only briefly summarise the results obtained. The results were based on data from international as well as UK sources and may therefore be regarded as generally representative of conditions worldwide. The oil price, which occurred after the calculations were complete, makes little difference to the estimates of the costs of ships' time, for ships were costed as though they were idle. The cost of delaying oil and oil-based cargo has clearly increased.

The object was to devise a method of evaluating the cost of different ships' time so that the value of avoiding delay could be calculated. The method was applied to tankers, general cargo carriers and tramps, oil/bulk/oil carriers, container, roll-on roll-off and LASH vessels, and also to cargo and containers. Tables and charts were drawn showing, for example, how the cost per ship-day in the various types of ship varied with deadweight tonnage or numbers of containers carried. The importance of such information to decisions about maritime operations, and to investment in and the operation of ports and navigation facilities hardly needs emphasis.

As to the method, the authors ruled out the use of operators' opinions and records of maritime prices. Surveys of opinion are notoriously difficult to interpret and are generally subject to influences of the moment that hindsight finds difficult to recall with any accuracy. Price information can be similarly misleading: long-term charters are not fully published and can also reflect aspects of ships' financing; short-term charters fluctuate and are particularly subject to occasional influences like the value of a given cargo. Nor is charter information available for such classes of ships as container vessels and the different elements in the pricing of conference services are hard to take into account in consistent fashion.

The chosen approach was based on the concept of long-run opportunity cost and amounts to a practical application of principles basic to the method of project choice described in my earlier talk which the reader is assumed to have read. The opportunity cost of a ship's time is measured by the amount the ship could have earned had it not been delayed. This amount must, of course, be qualified by the variable costs that would have been incurred in earning the amount forgone. However, if we assume that earnings reflect long-run costs plus a normal increment of profit, we can base estimates of long-run opportunity costs on the capital charges for a ship together with such time-related costs as those for the

fuel load, stores and provisions, insurance repairs and administration as contrasted with those costs associated with specific operations such as port charges and fuel bills.

Although the method was judged superior to any alternative, it is not without its difficulties. They should not be overlooked because they set the results in perspective. First, there is the shortage of cost data, which, in this case, was overcome by the generosity and co-operation of many bodies. Second, although estimates of long-run opportunity costs can be calculated, decisions in particular circumstances may find short-run opportunity costs more relevant and quite unrelated in value to the long-run estimates made. Thus, short-run opportunity costs of delay may be zero if there is no advantage in arrival before a given time, or they may be very considerable if a profitable charter stands to be lost if a given delivery is late. Third, there may be differences between delays to a ship in isolation and one that is operating as part of a closely interdependent system. Finally, some time-related costs assumed to be long-run in character may reflect ship's use rather than the passage of time; idleness may promote fouling and bring forward dry docking at a cost; and certain stores, e.g. lubricating oil, which will not be consumed if a ship is idle for considerable periods of time.

The levels of earnings forgone were calculated as those that would yield zero net present values at an appropriate discount rate, given the capital charges and time-related costs indicated above. The discount rate to be used in such calculations from the national point of view should be the real long-run social opportunity cost of resources in the country in question as defined in the fourth paragraph of the section "Public and private sector appraisal". Private interests concerned more with maritime operations than, say, port and navigation facility investment might choose a real long-run private opportunity cost based more on their own operating criteria.

Calculations were made at 8, 10 and 12 per cent real rates of discount in terms of a result of the following form:

$$\text{Cost of ship's time per day} = \frac{C + L + A}{D}$$

where C is the capital cost of a vessel divided by the annuity factor at the test rate of discount for a period equal to the life of a vessel. This is equivalent to the real capital cost per annum.

L represents labour costs per annum. It was assumed in the exercise that these would inflate at 3 per cent per annum relative to all other costs to reflect the advantage to labour from economic growth.

A represents the annual sum of all other time-related costs, and

D is the average number of days worked per annum.

* Presented by Mr. D.R. Coates, Department of Industry, London.

^{1/} *The Cost of Ships' Time* by R.O. Goss assisted by S. Herman, M. Mann and Mrs. S. Webb, Occasional Papers of the Government Economic Service, No. 10, (London, HMSO, 1974). The paper will be reprinted in *Advances in Maritime Economics*, R.O. Goss, ed., to be published by Cambridge University Press in 1976.

The following summary of results is illustrative rather than comprehensive. I hope it will suggest the usefulness of work along these lines and encourage the reader to turn to the full report.

Comparison of the results of calculations of the cost per day per thousand dwt shows that all classes of ship are subject to considerable economies of scale in operation, especially up to about 100,000 dwt. Within similar classes by size, the costs of delay to general cargo, ships and tramps exceed those to tankers; and the delay costs to tankers exceed those to bulk carriers and OBO ships but by a smaller margin. Economies of scale in time-related costs are greater than in capital costs.

Once the costs of delay to cargo are taken into account, the importance of delays to general cargo vessels relative to other vessels in similar classes by size are emphasized. On pre-oil price increase figures, delays to tankers of 10,000 dwt incur costs on account of cargo that are only about 2 per cent of total delay costs, a figure that increases to about 12.5 per cent for a 500,000-ton dwt vessel. Delays to general cargo vessels of

10,000 dwt incur cargo costs that are already 45 per cent of the total delay costs and the relative proportion increases rapidly with increasing size thereafter. The oil price increase will have narrowed the gap a little, but the point remains.

Because of the high capital cost and short life of containers, the capital charges and therefore the time value of containers is highly relevant to the delay costs of container operations. The costs of delay to insulated containers was shown to be only slightly less than those of delay to cargo contained; although, because of the sophistication of container ships, the costs of delay to cargo and containers together were less than to the ships alone.

One general conclusion to be drawn from this work is that, for any physical flow of cargo, reducing delays to smaller vessels is likely to be more important than to larger, and the relative importance of reducing delays to general cargo vessels of any particular size is likely to be greater than for vessels of similar size in any other class.

INVESTMENT IN SHIP ACQUISITION*

Investment in new tonnage is, for many shipowners, a question of replacing vessels which have been lost or scrapped; for others it involves fleet expansion and for yet others it may involve the development of a new service involving new technology and a project having wider ramifications than shipping alone.

Historically, ships were often bought jointly by a number of people having a common interest and, for this purpose, a ship could be divided into 64 parts with as many owners or joint-owners named in the certificate of registry. In more recent times, the unit is more likely to be the ship — there are still, for various reasons, a large number of one-ship companies — or a fleet. For very many years, particularly in the United Kingdom, the borrowing of money for ship acquisition was anathema to shipowners and this may well have been a major cause of the relative decline in the British merchant fleet during the present century. In prolonged slump conditions, profits were minimal (or indeed non-existent) and there were inadequate funds available to allow fully for depreciation. Unless shipowners had reserves available from previous shipping booms or from the sale of second-hand tonnage, the purchase of new tonnage was not contemplated. On the other hand, during shipping booms, shipowners can often command vast profits which may, in extreme cases, be great enough to pay off the cost of a vessel in 1-2 years. Because the traditional shipowner was in the business of operating ships, the profits were immediately used for the purpose of fleet expansion or replacement. This situation tends to put pressure on shipyards and causes a cyclical demand for new tonnage and a consequent cyclical change in shipyard prices.

For one reason or another, shipowners have not always, in spite of a sound financial basis, had the liquidity to finance the purchase of new tonnage. Ship mortgage banks have developed to lend money for this purpose and this still remains the most common way of raising capital to-day. The main requirement is that a ship floats, it has value and can perform its function efficiently. The value of the ship usually fluctuates with the state of the freight market, as was witnessed in the 1950s in respect of liberty ships, and it follows that banks are somewhat reluctant to lend money without strong guarantees to finance more than say 50 per cent of the cost of a new vessels. Still less are they prepared to lend money for the purchase of second-hand tonnage. Apart from the fluctuating value of a vessel (which is less of a problem in periods of inflation), the banks need to be reasonably certain that the shipowner is of substance and knows the business well; in other words, his track record must be good. No loan is entirely without risk. Insurance of the vessel covers a great deal of the risk but there is always a chance that a warranty may be breached, leaving the ship technically uninsured. The mortgage bank is also concerned that the shipowner's cash flow, whether from the mortgaged vessel or from other sources, will be

sufficient to pay back the loan as instalments fall due. Employment of other ships on liner trades or on long period charters at good rates can be important from the banker's viewpoint. During a period of high freight rates, bankers may be more than willing to finance ship construction, while, in a depressed freight market, they become very much more selective and careful in granting loans.

A substantial company, such as P&O or Ocean Transport and Trading, with assets worth hundreds of millions of pounds would have little difficulty in borrowing for fleet replacement. The loan, if of moderate proportions, would be made as requested, without reference to the specific needs.

Early post-war inflation, accompanied by higher building costs, caused shipowners to complain that tax-free depreciation allowances were insufficient to replace old and uneconomical vessels. Some Governments were persuaded consequently to grant investment allowances, which, while better than nothing, were of no value unless sufficient profits were already being made.

From the mid-1950s onwards, there was a rapid expansion in world trade accompanied by an even greater expansion in transport requirements expressed in ton-miles. This expansion occurred primarily in the carriage of industrial raw materials, with oil, iron ore and coal assuming the greatest significance. Commercial considerations led to the development of bulk, ore and tank vessels in sizes which, in the early post-war period of liberty ships and T2 tankers, the shipping fraternity could never have visualized. Once the necessary technology was developed and the commercial considerations translated into orders, ship sizes grew rapidly and steadily. Encouraged by subsidies associated with the reorganization of the national fleet and the post-war development programme, ship-building capacity and production forged ahead in Japan. Not only were Japanese vessels cheaper, but, more important, they were delivered on or before time: factors which influenced many European and American owners to order ships from Japanese yards.

The increased size, sophistication and automation associated with the post-war fleet led to prices beyond the means of most shipowners and would have stretched the resources of others to breaking point.

There developed, however, a new form of financing by which Japanese shipyards were able to give credit to foreign shipowners on the strength of a pre-construction time charter. The credits were based upon loans at subsidized rates of interest and guaranteed by the Government and funded partly by the Japanese Export-Import Bank and partly by commercial banks. Such arrangements usually secured loans of up to 80 per cent of the cost of the ship repayable over a period of 8 years in 16 biannual instalments with interest. The remaining 20 per cent or more was obtained from other sources. The pre-construction time charter was of greatest value in respect of tankers or combination carriers because, in these cases, the charterer is usually a major oil company

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or strong independent of unquestionable financial standing. Charters may be of 3, 5, 8 or exceptionally of 15 or 20 years duration.

Financing a single vessel in this way is not without risks. The pre-construction time charter cannot be expected to produce vast profits for the shipowner; indeed, in the early years, the cash flows generated by the vessel's employment may be insufficient to repay the loan. Although the vessel has a life of some 15-20 years, at least 80 per cent of the cost of the vessel must be repaid in 8 years. Inflation such as has been experienced in recent years can quickly turn what appeared to be a profitable charter into one giving rise to substantial losses. Charter hire is almost always expressed in US dollars so that, in the event of the dollar being devalued with respect to a shipowner's domestic currency, the charter can become an immediate liability. However, INTERTANKO, the independent tanker owner's association has managed to obtain renegotiation of some time charters with two of the major oil companies where hardship has arisen from this cause. Another risk arises when the ship through inefficiency of management or of crew is unable to fulfil the terms of the charter, leading to loss of earnings. The difficulties are less when the owner has earnings from other vessels free from encumbrances.

It can happen that a charterer, having engaged a vessel for a long period, runs into financial difficulties and cannot pay the charter hire. The shipowner will then have to try to fix a new charter agreement or employ the vessel on the spot market. The magnitude of the problem is geared to the state of the freight market at the time. The shipowner who is in difficulties as a result of inflation is probably better-off in that the value of the vessel would also be enhanced regardless of the state of the market. This being so, he could either sell the ship with charter attachment or raise sufficient funds from his own bank to provide liquidity during the difficult phase. At the end of eight years, with the loan paid off, the cash flow situation is greatly improved. It is at this stage or shortly afterwards that owners of tankers and bulk carriers often sell their ships on the second-hand market. This has two advantages: (i) proceeds from the sale which can be handsome can be used to finance the equity share of new tonnage, and (ii) the fleet is kept modern and efficient and obviates the problems which arise in the later years of a ship's life such as breakdowns, major surveys and repairs. It is generally recognized that a shipowner's greatest asset arises from the ability to buy and sell tonnage as market conditions dictate. This is not to suggest that profits are not made from ship operations, but rather that these profits are enhanced by buying and selling second-hand tonnage at the right time.

The repayment of loans can also be attended by risk of currency fluctuations. A British shipowner might be repaying a loan in yen, while incurring other costs in a multitude of currencies and earning in US dollars. If the shipowner has other ships, he may be able to offset the risk by ensuring that one or more of his ships are earning freight in yen: these earnings can be used to repay the loan instalments as they become due.

The expertise shown by Japanese shipbuilders, together with attractive credit schemes, naturally induced

shipowners who were allowed to do so by government regulation to desert their traditional domestic shipbuilders, thereby leaving the latter with very short order books. Western European and Scandinavian shipyards still managed to retain orders for some of the more sophisticated vessels, while the Japanese concentrated on bulk carriers and tankers in the Vlcc class. As a result, west European Governments were generally forced to support their ailing shipbuilding industries with capital grants and construction subsidies and by government-backed cheap credit schemes for national shipowners ordering from domestic yards. This has led to a situation where major shipbuilding countries all give assistance to their domestic shipyards in one form or another with the aim of remaining competitive in the world market. Much effort has been made recently to reach a comprehensive arrangement among Governments to do away gradually with all distorting assistance to shipbuilding, but it has not yet been possible to reach an agreement. However, an OECD 'understanding' has been reached regarding shipyard credit schemes. Recently, proposals have been agreed whereby the maximum duration of credit is seven years and the minimum downpayment 30 per cent. The minimum rate of interest remain at 7½ per cent. The United States is an OECD member which has not agreed to the 'understanding'.

For some of the larger loans, a number of banks may participate, including the clearing banks. One bank acts as the leader and may not itself retain any part of the loan. In this case, its profit is made on the commission charged for packaging the deal. It remains responsible in any case for collecting the loan repayments. Rates of interest can be variable depending upon the London inter-bank rates. Multi-currency clauses can be incorporated whereby the loan can be repaid in a mixture of currencies or converted into different currencies at certain times. The rate of interest can be fixed at a low level with a balloon payment at the end. Bankers sometimes borrow short and lend for medium terms at fixed rates of interest. This practice can result in sharp losses to the bank if interest rates rise steeply.

In the post-war years there has grown a fund of money in Europe and the Far East known as "Eurodollars." These arise as a result of United States balance of payments deficits. More recently there has evolved the so-called "Petro-dollar" resulting from Arab oil surpluses which they are collectively unable to spend on imports owing to their limited absorptive capacity.

Eurobonds are another source of ship finance which have been used to raise funds for shipping in amounts up to \$50 million. The number of issues for ship finance has been very small and one or two of them have been of a speculative nature. For the issue to succeed, a carefully arranged programme must be arranged for issue and the active participation of a large number of banks sought. The borrower must be of impeccable standing and also a shipowner of some substance. At the same time, the issue of the bonds must be guaranteed by a firm or body of unquestionable means. The bonds may be at a fixed or variable rate of interest and, in some cases, arrangements have been made to convert the bonds, at the bearer's

option, into company shares on an agreed basis at a given future date.

Time chartering a vessel can frequently provide both an easy and profitable method of ship 'acquisition'. Sometimes ships are chartered in to fulfil C.O.A. commitments or to perform a service where demand has unexpectedly increased. There are many cases of charterers making profits out of shipowning simply by taking vessels on time charter and then placing them on the spot market or re-letting them at a higher rate. An experienced shipowner can enhance his profits in this way, without any investment or expenditure whatsoever. Of course, no profits are easily made. The tramp market is speculative in nature and no one appears able to forecast long-term market trends with any degree of certainty. Forecasts have a habit of proving wrong, mainly because of unforeseen factors emerging.

Sometimes a shipowner, or more properly, a transport operator may wish to perform a combined transport operation. It is possible that the business contains a great deal of risk and the operator is not prepared to go to the expense of establishing an organization for shipowning. Instead, he can employ suitable vessels on time charter for a certain minimum period of time. With the funnels painted and names changed to suit the operator's trade name, to the casual observer the latter takes on the guise of shipowner. Over the course of time, however, the operator could, as circumstances warrant, gradually develop a fleet to phase in with that under time charter. As in the case of the major oil companies, the owning of a fleet of vessels enables the shipowner to keep a check on the cost of the chartered fleet.

A similar system of 'shipowning' comes a little closer to the real thing. A ship may be hired under a charter by demise (bareboat charter) whereby the charterer must organize the manning, insurance, repairs and stores and must in fact do the work of a shipowner. The advantage lies in the smaller annual capital costs and the absence of heavy capital commitment. The charter would normally be for a number of years with option to renew. In addition, the borrowing powers of the company might be enhanced because of the absence of capital debt associated with mortgages and other loans.

Leasing. A distinction is usually drawn between an operating lease which is a short-term arrangement and a true lease where the equipment is rented for periods equal to the normal economic or accounting life. For a ship, this may be 15 years or more depending upon the type and sophistication of the vessel. The lessor always remains the owner of the vessel and there must be no agreement with the operator or lessee to transfer ownership — otherwise it becomes the subject of a hire purchase agreement and the whole contract would take on a different aspect. Since the lessee manages the vessel as though it were one of his own fleet, one may ask what is the difference between a lease and a bareboat charter. There are perhaps two main differences: (i) a bareboat charter could be for any length of time up to that of a lease and (ii) the lease is far more complex as a legal contract, containing 'hell and high water' clauses which provide for rental or charter hire to be paid even if the

vessel is sunk, until such time as underwriters indemnify the owner for the loss.

Leasing is of course another method of ship financing. When a ship is purchased on credit through shipyard or bank loan, the short period of repayment can place too big a burden on the owner's cash flow. Banks are not normally amenable to lending money on a 15 or 20 year basis. The lease circumvents the problem of cash flow by allowing the cost of the vessel to be paid off over 15 years. The first period is the prime period and this may be followed by an optional secondary period at a lower rental. The main drawback for the ship operator is that he can never become the owner and be in a position to sell the ship at an attractive profit if the market allows. It is also true that the operator is virtually obliged to operate the vessel for the full term of the agreement regardless of requirements. It is possible for the lessor and lessee to agree to sell the vessel at some stage, the proceeds of the sale being used as rebate of rental for the lessee. If the market price of the vessel is low at the time, the lessee is likely to be substantially out of pocket. There may be a provision in the lease for the vessel to be sold at the termination of the lease and the profits shared between the parties on an agreed basis.

Although the lessee has commitments to pay rental, this may leave his borrowing powers intact, so that, with rental being paid out of earnings, profits are enhanced without increasing the capital base. Another advantage of leasing from the ship operator's viewpoint is that the owner or lessor arranges all payments during construction, the lessee making his first quarterly payment on taking delivery of the vessel. Nevertheless, the lessee is normally able to order a vessel to his own design specifications with all the usual extras, and also to supervise the vessel during construction as though it were his own. Again, although it is probably more usual for payments to be for a fixed amount, the lease is flexible in that it can permit a variable rental profile to suit the needs of the lessee.

Leases are extremely important instruments of finance in the United States and are becoming more important in Europe for the financing of new tonnage and ancillary equipment such as containers. Tax-based leases which are particularly significant in the United States and the United Kingdom arise from the accelerated depreciation allowances which can be used to set against profits before assessment for tax. Many owners in the United Kingdom however have so much capital allowance in hand that they are unable to benefit from accelerated or free depreciation in respect of new tonnage. On the other hand, banks and insurance institutions are labour-intensive and do not normally have any capital allowances, except in the way of property.

By entering the shipping business as a lessor/owner, these financial institutions are able to take advantage of the capital allowances and pass some of them back to the lessee by way of reduced rentals. The lessor is also able to take advantage of subsidized loans which are available in most shipyards. The terms of the lease are governed partly by the rate of corporation tax and partly by the rate of exchange in force between the country of incorporation of the lessor and that of the shipyard. If the two countries are identical, there is no problem regarding currency risk.

A third factor which may determine the charter hire rate is the rate of interest payable on certain loans to the owners. Since 1973, the Finance Act has made it more difficult for banking institutions to take advantage of capital allowances through the establishment of 'shipowning subsidiary companies. Some have circumvented the problem by arranging for their subsidiary companies to be trading within the meaning of the Act by purchasing an older and smaller vessel and allowing the original owner to charter it back on a bareboat basis before the 'mainlease' vessel is delivered.

Legal difficulties can arise in the event of an owner leasing out a number of vessels to different operators. Any maritime tort by one of these ships, e.g. in a case of oil pollution, could lead to the arrest of a 'sister' ship in the management of another company. Although the charter indemnifies the lessee from losses arising from such circumstances, it is evident that commercial and legal problems of a serious nature can arise.

Leasing companies are normally but not necessarily consortia of major banks. It has been observed that, if tax-based leasing were to expand to a large extent in the maritime field, there would not be sufficient corporate profits available to satisfy total demand. In the United Kingdom, the total corporation tax payable in each year is about £1,500 million, so that, with LNG carriers costing as much as £40 million and Ulccs costing about the same, available profits would be quickly dissipated and the

Inland Revenue quick to close the door. Because of this, there has developed an alternative though more expensive type of lease known as the "offshore" lease. The leasing company establishes a subsidiary company in a country where financial and tax problems are minimal, the vessel is purchased by this subsidiary, again using shipyard loans if available, and registered under a 'flag of convenience'. The lessee can then operate his ship, it is claimed, at lower cost because of the less rigid or non-existent manning scales. The advantage of offshore leasing is that taxes are largely avoided and thereby charter hire reduced, albeit not to the same extent as when tax-based leasing is employed.

The tax-based leverage lease as practised in the United States is perhaps the ultimate in leasing from the bank's viewpoint. Under this system, a package is put together where the lessor, a consortium of banks, becomes an equity participator by advancing only 20-40 per cent of the loan capital. The lessor is still able to take advantage of accelerated depreciation allowances, investment tax credits and shipyard loan capital. The remaining 60-80 per cent is lent by institutional investors at a fixed rate of interest without recourse to the lessor. They have a mortgage on the ship as security and charter hire is assigned. The gearing on this kind of package is substantial, but the risks are magnified to the same extent.

ROUTE RESEARCH ANALYSIS AND PLANNING*

The discussion of this topic is here treated in two parts:

- (i) General factors which are important to the analysis of trade routes and
- (ii) Specific factors which must be considered and evaluated in contemplating a change from a conventional liner service to unitization on a particular trade route.

In the context of route analysis, the balance of trade must be considered, not in monetary terms or from an over-all viewpoint but in relation to shipping space on a specific trade route. A trade route can be defined as that lying between a range of ports in one country or region and a similar range in another between which there exists a substantial movement of seaborne goods. Trade involving wayports must also be considered, even though some of the traffic originates outside one of the ranges of ports under consideration. In addition, trade may originate from land-locked countries wishing to use one or more of the trade route ports and the latter may also cater for entrepot traffic.

Although transport costs normally comprise a relatively small proportion of the total cost of goods, their level can have important consequences when there exists strong competition in contiguous trade routes. Market research is important in discovering the extent to which there exists potential trade which fails to move as a result of tariff barriers or because, at the present level of freight rates, the goods cannot compete in the overseas market. In other words, the elasticity of demand for exports and imports must be explored.

Unfortunately, the balance of trade cannot be quantified simply in terms of volume, weight, value or even freight tons which is a mixture of units. First of all, the trade must be analysed by commodity, preferably according to the Standard International Trade Classification (SITC) and by weight. Secondly, the quantities which move in bulk and those which could potentially move in bulk should also be noted. Thirdly, those commodities which move in specialized or industrial carriers, such as banana, refrigerated, LNG or ore carriers, must also be noted. Because bulk carriers, tramps and specialized tend to transport goods in one direction only, cargoes moving by these means tend to upset the balance of trade. As a general rule, trade between developing and developed countries consists of raw and semi-processed materials in one direction with manufactured goods moving in the other. If the trade is in balance from a monetary point of view, greater shipping space will be required on the leg from the developing country because of the lower value and greater volume moving in this direction. If the ships are provided by the developed country, this will mean that less manufactured goods are supplied and the imbalance made worse.

Trade statistics can (with a little organization) be

collected with the aid of the shipping companies, port authorities and customs. Potential trade is more difficult to establish, but shipping conferences can provide some information and shippers' councils may also provide some.

Ideally, all trade should be balanced and move in liners in order to keep the latter fully employed in both directions. Factors which prevent this are: (a) movement of some cargoes by non-liner vessels and (b) seasonality of trades.

The movement of some cargoes in tramps may help in balancing up the liner cargoes. If not, then this cargo, if suitable, would be better carried in liners as bottom or supplementary cargoes. Obviously, crude oil and iron ore are among those which are eminently unsuitable.

A great deal of primary produce is seasonal in nature and causes peaks and troughs in transport requirements. Many fruits have short seasons and tend to cause congestion in ports, storage and other parts of the transport system. Fruit cannot be kept indefinitely, even under refrigeration, but, in any case, the value of transporting fruit overseas lies in the high level of demand when out of season in the market country. Peaks in trade patterns are inevitably responsible for the provision of additional ships at higher cost since, unless they can be redeployed, these ships will be underutilized during seasonal troughs. The problem is partly solved by chartering in tonnage as required to service the peaks, but, when this occurs, costs will depend upon the state of the tramp freight market at the time and may lead to instability in freight rates. Planning for the seasonal peaks can also bring problems, especially if the start of the season happens to be late, as sometimes occurs in the case of apples and pears; the killing of new season's lamb may also be delayed through the reluctance of farmers to kill on a poor market. Where possible, seasonal peaks should be flattened through the provision of storage facilities in the producing country. This will entail extra cost, but may be offset by lower transport costs if only as a result of conferences not imposing congestion surcharges.

Ports. A large fraction of the transport costs for liner cargoes arises in the ports. These costs may be subdivided into (a) cargo handling costs (b) cost of ship's time and (c) port charges, agency, tugs and pilots.

Cargo-handling costs may be labour or capital intensive according to the cargo being handled and the system in operation, i.e. containers, pallets etc. In developing countries, labour costs are low and cargo-handling costs are also relatively low. The low cargo-handling costs however may be partly offset by the increased cost of ship's time resulting from a low berth throughput. The cargo-handling rate also partly governs congestion costs since, the greater the berth throughput, the lower will be the incidence of queueing. In developed countries, cargo handling is usually more capital-intensive because labour costs are considerably higher. Throughput is normally greater also, with the result that the incidence of queueing is smaller.

One solution to the port problem is to provide more

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berths; another is to increase the speed of cargo handling by unitization or other more capital-intensive methods; a third which is sometimes advocated is to improve vessel scheduling. This last may sound feasible at first, but a little thought soon indicates the need for an extremely powerful computer and highly sophisticated software to go with it. Vessels' schedules are apt to become sadly out of phase for a variety of reasons: strikes, breakdowns, cargo shortage, rain, heavy weather, fog — the list is endless. In any case, scheduling for maximum efficiency at a port inevitably leads to slower steaming at sea for a great many vessels. This in itself is almost as costly — though not quite — as that of lying at anchor waiting for a berth.

Traditionally, liners have called at many ports in order to load or discharge cargo. Some ports are 'base' ports while others are designated 'direct' or 'inducement' ports at which calls are made only if the quantity of cargo offering makes this course financially viable. As ships have become larger, more expensive and sophisticated, liners' schedules need to be rationalized in order to reduce the number of calls. However, this can be achieved only through conference agreements and then only if the 'mix' of cargo obtainable can satisfy loading requirements. The problem of bunching ships witnessed by seven ships calling at seven ports for similar cargoes on the same trade route could quite easily be solved under the closed conference system. With open conferences, agreements would be much more difficult. Rationalization of the New Zealand/UK trade was highly successful some years ago with the assistance of the all-weather meat-loaders located in the South Island at Bluff and Timaru.

Associated with the question of numbers of ports of call for liners is the provision of feeder services which, by bringing in traffic from, and distributing traffic to the more remote ports can help to reduce total costs. Whether the liner makes additional calls depends upon three principle factors: (a) *Distance*. The longer the distance, the cheaper it would normally be for the liner to make an additional call. (b) *Quantity of cargo*. The larger the quantity of cargo, the cheaper it becomes to deliver or collect by liner rather than feeder. Feeder services may also be made by road or rail, but, again, distance is an important consideration. (c) *Freight rate for cargo*.

However, the additional strain placed on pivotal or base ports when served by feeder vessels can lead to added congestion. The development of such ports needs careful consideration as does the establishment of feeder services for which high utilization is almost as important as with the larger ocean-going vessel.

Conferences and competition. The establishment of liner conferences brings, in general, greater stability to a trade route. The existence of tramps and bulk carriers as established carriers can do little harm to the liner service. Dangers arise when tramps enter the market as casual interlopers causing temporary freight wars. Shippers may benefit in the short run, but, as soon as the competition disappears, conference lines must recoup their losses by charging higher freight rates. Although it is generally considered that conferences set the freight rates and shippers become price takers, there are some monopsonistic cases where the major exports pass through the hands of marketing boards and tenders may be invited for some

or all of the traffic.

Wayports. These are ports lying en route between ports at each end of the major trade route. Serving these ports may complicate the scheduling of liner services, but often these ports provide cargo on what would otherwise be a voyage leg greatly underutilized in terms of shipping space. Rate structures may not reflect distance but rather the opportunity cost of loading and/or discharging in these ports. One of the main complaints registered by national lines of developing countries has been that admission to the conference has not brought with it admission to the wayport conference, a situation that can leave them vulnerable through operating vessels with spare capacity.

Pricing policies and cost of transport. Freight rates for liner services are related to cost and to 'what the traffic will bear'. In the long run, however, the total freight bill for outward and homeward cargoes is more or less equal to the cost of providing the service. Different cargoes pay different rates according to their ability to bear the charges, so that rates on the outward and homeward legs may differ as a result of imbalanced trade. Thus all things being equal, the freight rates on the leg carrying exports from developing countries would tend to be higher by virtue of the greater pressure on space. This factor, however, is more than compensated for by the lower values of the cargoes. The result is greater revenues earned by ships sailing with say a 60 per cent load factor in one direction than with a 100 per cent load factor in the other.

Frequency and adequacy of service. The frequency of service is a quasieconomic variable which is governed by the economic size of the ships and the volume of trade. In many cases, however, there are too many ships calling at too many ports for too little traffic simply to satisfy the wishes of a minority and the help keep competition at bay. It is the strength of the loyalty ties which play a dominant role in this respect. The frequency of service for exports, however, is partly determined by the frequency of service for imports and, also, the types of ships and their degree of sophistication are often governed by the types of cargoes comprising an important proportion of that on one leg.

The question of frequency and regularity needs careful examination in order to attain a satisfactory balance. A too frequent service implies high cost, while long intervals between services inevitably lead to competition and incursion into trade routes by non-scheduled carriers. The size of ships which are suitable for a trade is very important and is governed chiefly by distance, cargo-handling rates and number of ports required to be served.

Commodity competition. The revenue from operating a liner service stems from the carriage of a wide range of cargoes. The loss of certain cargoes through their carriage by chartered vessels or industrial carriers can be very serious and lead to temporary overtonnaging of the trade route. The tariff is established to yield a certain level of profit from a given mix of cargo. If this mix changes over a period of time, profits can rise or fall even without the occurrence of cost changes, simply because

more or less of the higher-rated cargoes is being carried. Sometimes, on newly established routes, tariffs are based upon one evolved on an entirely different trade route having a vastly different cargo commodity structure. This kind of adaptation is likely to lead to many complaints and requests to adjust freight rates. If a country can import a commodity such as flour from two widely separated sources, such as France and Australia, a change in the price of flour in one of these countries relative to the other could result in a swift change in purchasing policy by the country concerned. This kind of situation can cause a serious loss of cargo to a shipping line, with consequent loss of revenue. Conferences must be aware of such circumstances and be prepared, if the circumstances admit, to allow reductions in freight rates as soon as the facts of the situation are appreciated. A careful analysis of commodities and the revenues accruing from them can ensure that the rate structure does not become so far out of date that trade suffers.

Introduction of unitized service. The change from a conventional liner service supplemented by tramp and/or specialized tonnage to a unitized service using containers, pallets, LASH, or ro-ro vessels deserves special consideration. It does not follow that, because unit services are introduced effectively on one route, a similar service will be suitable for another.

The ultimate consideration must be the relative costs of one type of service vis-à-vis another. In the analysis which involves a quantitative study of cargo types, the first task must be to classify the goods as to suitability for unitization. The physical aspects of the predominant cargoes may well dictate the type of service most suitable and economic for the trade. The question of balance again arises. Cellular container ships are not very versatile in that bulk cargoes and large indivisible loads are totally unsuited to these vessels. Certain cargoes could be carried in containers, including close-weight cargoes, but the space lost is so great that the benefit is likely to be very marginal. If a limited service is contemplated to serve the balanced part of the trade, some other service must also be established or continued to carry the residual cargoes. This will probably entail one low-cost and one high-cost service which, taken together, are no more beneficial than the original conventional service. A choice between a new unitized service and a conventional break-bulk service entails a careful study of the particular trade where some of the most important factors governing the choice would be:

- (i) Volume of trade
- (ii) Type of cargo
- (iii) Length of trade route
- (iv) Port infrastructure
- (v) Labour costs
- (vi) Proportion of goods moving door to door
- (vii) Quality of inland transport system
- (viii) Number of ports required to be served
- (ix) Availability of loan capital

A critical question concerns the level of investment required in ports and vessels and whether and on what terms the money is available. In planning for the future, it is necessary to forecast future trends in the trade. In planning for port development and ship acquisition, it

must be borne in mind that such projects have a long economic life and it is sometimes prudent to build some spare capacity into the system. At the same time, future cost comparisons may be made, based on assumed relative changes between capital and labour costs.

Certain mistakes may have been made in trade route analysis by comparing the best of one system with the worst of another. It is imperative to explore the possibilities of reducing transport costs by rationalization, removing bottle-necks or by other minor investment before the decision is made to invest in a highly capital-intensive system such as containerization. Again, in comparing systems, empirical data for the given conditions are far more useful than theoretical data which may not take into account the incidence of weather of a seasonal nature. Apart from other factors, unitization can protect cargo from precipitation, allowing work to proceed in all weather conditions. Physical conditions in ports, such as swell or high winds, could give rise to difficulties in handling containers or LASH barges. Moderate or heavy swell conditions, even if not persistent, could necessitate investment in a new or extended breakwater system.

In the event of a decision to change to a new unitized transport system, shippers must be given adequate warning and steps taken by shipowners to show how the shipper will be affected in terms of cost, insurance, speed of service and risk of damage to goods. In addition, shippers must be re-educated to present their goods for shipment in such a way as to be best suited to the proposed service. Some shippers, who have been in the habit of despatching machinery as large indivisible items could find that, by partial dismantling, the several components will fit comfortably in standard containers. It is quite possible that some shippers will have reservations about the new system and so it is of the greatest importance for the shipping company's market researchers to maintain close contact with shippers at this stage. In the event of containerization, although the system is founded on the concept of standardization, it may nevertheless be possible for the shipping company to provide special or partially non-standard containers to suit the needs of certain shippers. Shippers should be given advice on suitability of cargoes for stowing in containers or maximum weight and height of goods to be stowed on pallets. Certain goods require special care in stowage, while others may taint containers or lead to a need for fumigation of containers after use. Although containers help to prevent tainting and the spread of fire due to their limited size, they do present problems involving condensation since they cannot normally be ventilated. As has been recently shown in the case of a container vessel carrying the poisonous arsine in one of the boxes, dangers can arise through hazardous cargoes being carried in containers without proper labelling and notification. Such containers may end up in the middle of a stack and be totally inaccessible at sea.

One of the problems of unitization particularly relevant to the container system is the effect it produces on dockworkers. The whole concept of unitization is founded on the substitution of mechanical handling of standardized units for labour-intensive break-bulk methods of cargo handling. It is therefore not unnatural that

the introduction of such systems should lead labour into restrictive practices coupled with demands for higher wages. Labour inevitably requires its share of any new cost-saving methods in this way. Unfortunately, it happens that granting pay increases to dockworkers engaged in container handling leads directly to demands for the same rates for those still engaged in break-bulk methods. If containers move on a port-to-port basis, they are less effective in reducing costs, but the jobs of most dockworkers will be protected since employment in stuffing and stripping containers will take the place of loading and discharging ships.

Some research into new packing and processing methods may need to be undertaken to gain maximum benefit from containerization. High-density dumping of wool is an example which illustrates the need for care. Dumping improves the stowage properties of wool, but excessive pressure damages the wool fibres.

Unit load methods are of greatest benefit in reducing ships' time in port. Delays, such as congestion and inefficiencies in bringing cargo forward for loading or clearing after discharge, have serious consequences for the economies of the system. What is most important is whether the inland transport systems or warehousing or packing centres can cope with the rate of cargo movement necessary to obviate delays.

In conventional cargo-handling systems, consignments are frequently spread among three or more hatches to avoid delays in loading. This has an important effect on discharge, however, since delays in sorting will occur and stevedores tend to discharge cargoes in order of convenience rather than need. Unitization avoids this problem, although it has implications for the port system employed in storing containers prior to delivery.

The introduction of a container service will almost certainly reduce the number of ports served by direct call

at each end of the trade route. The provision of coastal feeder services or inland transport for base or direct ports at which container vessels are not scheduled to call will increase costs for some shipments while reducing those from the new base ports. The added cost of transport by feeder service is seldom referred to in container studies; in some cases this cost is borne by the shipowner while in others it must be borne by the shipper. In the event of base ports not being designated ports of call for the new service, equalization charges would normally be put into operation. Also, because of the different nature of the container service, especially in the door-to-door shipments, freight rates must be designed to include other charges not usually included in break-bulk freight rates.

Shipowners are not normally prepared to invest heavily in an overseas port, especially in the infrastructure which cannot be salvaged in the event of economic or political difficulties. Nevertheless, close co-operation must exist between shipowners and port authorities if the planning of a new service is to be accomplished satisfactorily. Capital-intensive systems need careful timing in order that all parts of the system come into operation at the same time. Shipowners may decide to operate in a consortium or pool, and conference arrangements will need to be modified to allow for a new service. A berth provided specially by the port authority may be on a private or common-user basis for the shipowner. Much will depend on the expected throughput of the trade. Cranes and other equipment may be provided by the shipowner or by the port; in the latter event, leasing arrangements will be made.

The transport systems of today are total in nature and no longer can investment in one subsystem be made without reference to others. The whole must be planned in a spirit of close co-operation and harmony by all participants in the system.

CHARTERING*

Introduction

A charter party is a contract between two parties, the shipper (or charterer) and the shipowner. It is subject to laws of the country in which it has been signed and is, in effect, a joint venture: both the ship and the cargo are at risk. The special terminology for a charter party should be made simple and relatively easy to understand. Two types of forms are used to draw up a charter party. They are the standard and the private form, each basically having the same provisions.

Charter parties deal exclusively with tramp vessels, or liner vessels chartered out for tramp voyages, varying in size from, say 300 tons dwt to 500,000 tons dwt.

The world seaborne trade is expanding continually, from 1,640,000,000 metric tons in 1965 to 2,820,000,000 metric tons in 1977, at an average rate of increase of 8 per cent per annum. To handle this expansion, the world merchant fleet has also expanded in capacity if not in numbers; in 1975 it was 311,300,000 tons grt, which is more than double the figure for 1964. By far the larger proportion of cargo carriers (and hence tonnage available) is in bulk carriers, including tankers.

To a shipowner, the charter party is an end in itself: he is providing the designated service for the agreed remuneration. To the charterer, it is the link or module between an f.o.b. purchase and a c.i.f. sale. It is the ocean bridge.

The technique of chartering remains fundamentally simple. After all, it reflects two complementary desires: the need on one side to obtain space for cargo and the need on the other to obtain cargoes for ships. The charterer requires a seaworthy ship that will deliver his cargo in good condition without delay. The essentials are a dry, clean hold, i.e. a box. The flag or nationality of the ship or crew are immaterial, but speed is usually important. Too much speed pushes up costs. Slow speeds are sometime advantageous in marketing. But the speed must be reasonable. Political considerations may dictate national carrier usage, etc.

In general, smaller quantities of cargo are suitable for liner carriers and larger quantities are suitable for bulk carriers on the charter market. Shippers of large cargoes seek economics of scale. In the intermediate range, there is pressure on liner operators to reduce rates for larger parcels, or run the risk of them being shipped as part cargoes on tramp vessels.

The language of charter parties is English due to the historical fact of early trading which has led to traditional terms or expressions known all over the world and which have been tested in court. (The same tends to apply to bills of lading). There is thus legal backing in cases of dispute. It can be dangerous to translate as shades of meaning can alter and the legal precedents are lost. (Exception: the short-sea trades which are often in a

language other than English).

The document itself puts responsibilities and liabilities on both parties; again it is a joint venture (e.g. general average). Any confusion of technical jargon should never be allowed to impede the commercial intentions of the parties. There is no reason why two sides to any shipping negotiation cannot reach a clear understanding of each other's position and reflect this in straight-forward basic terms and conditions so that charter details can be finally settled at a later stage if necessary. It is unwise to attempt to make the terms and conditions too burdensome, taking advantage of temporary market conditions. When they change, bad relationships exist to the detriment of the original fixer. This does not apply to the freight, only to the conditions — lay days etc.

The wording should be accurate, terse, lucid and couched in simple, well-understood shipping terms for voyage charter parties.

It will contain basic information on the parties to the charter, the name of the vessel, dates of presentation, port(s) of loading and discharge, type and quantity of cargo, agreed working time, effects of time saved and time lost, lay-days etc.

It will contain clauses covering happenings outside the control of either party, such as bad weather, strikes, orders of port authorities, and unforeseen political or physical problems. The terms are absolute and implicit and can only be negated by expressed provisions to the contrary in the charter party. The terms should be fair and reasonable, freely negotiable through offer and counter-offer.

All this is expressed on a standard charter party form, adapted as mutually agreed. It can fall into one of two categories:

(a) *Standard charter parties*, put out by shipping organizations, e.g. those jointly published by the UK Chamber of Shipping and the Baltic and International Maritime Conference located in Denmark. (The latter is not to be confused with the Baltic Exchange in London which does not issue standard charter parties). These charter parties tend to favour shipowners and have become progressively weighted in their favour (c. Baltime 1912, Baltime 1920 and Baltime 1939). These standard forms now tend to be produced after consultation with merchant interests and trade associations — and hence are mutually agreed in general terms.

(b) *Private charter parties*, used by regular shippers in particular trades. Here the terms tend to favour the charterers, but they include the special needs for specific trades, e.g. requirements in the bulk sugar trade, such as suitability of holds for grab discharge, ventilation and tarpaulins covering bulk lumber.

Special clauses can be added to standard forms, e.g. draft requirements at certain ports.

Charter parties can be for more than one voyage (i.e. continuous voyages), in which case they are usually for homogeneous cargoes, or they can be for part cargoes, in which case special clauses will be required for cargo

* Extract of notes from lecture delivered by Mr. A. Morris, Institute of Chartered Brokers, Baltic Exchange Chambers, London.

separation etc. Voyage charter parties may be to or from individually-named ports or they can cover a range of ports, e.g. Antwerp/Hamburg inclusive. The shipowner is usually indifferent, provided the distance and expenses involved are much the same. Notification of final port can be left quite late and this can be beneficial to the charterer. It is a valuable facility in the commodity markets.

Liner companies often enter the charter market either to charter in to accommodate seasonal increases, out of balance trades etc. or to charter out excess tonnage arising out of a variety of circumstances. This is only financial sense.

Freight rates may be quoted on various bases. Where the commodity is well-known, with an unvarying stowage factor, the unit is usually the deadweight carrying capacity (allowance must be made for oil, water, stores etc.). Where the stowage factor can vary, e.g. undecorticated groundnuts, it is safer to work on a lump-sum basis, worked out as an average of previous experience — this then puts the risk of storage on the charters rather than the shipowners.

Choice of vessel is often dictated by its individual bale (or grain) capacity in relation to its deadweight capacity, matching this as far as possible to the stowage factor of the commodity to be carried. This relationship can be purpose-built into specialist vessels (known as "rho").

The Grovpage Concept also plays a part in the charter market. Organized by forwarding agents consolidating many small shipments which would otherwise go on liner vessels, they are able to command sufficient tonnage to fill whole shiploads, passing back some of the advantages of scale to individual shippers and retaining some (plus their commission from shipowners) to cover overheads and produce profits.

Types of charter parties

(a) *Voyage*. This charter party is simply a special form of contract, but, because of the joint venture, it contains provisions peculiar to the shipping industry.

As time is most important, it follows that, apart from clauses concerned with readiness of ships, suitability for cargo, loading/discharging ranges and rate of freight, the essential provisions concern time allowed for loading/discharging and rate of demurrage/despatch.

To the shipowner, the charter party is the end in itself, but, to the charterer, it is the module between a f.o.b. and a c.i.f. sale; he is not basically concerned with the flag of the ship but requires a seaworthy ship which will deliver his cargoes in good condition without delay. The bulk cargoes of the world are carried in chartered ships — grain, fertilizers, timber, sugar, oil, coal, bauxite and ores are examples.

(b) *Time*. The charterer has the use of the ship for a period of time instead of for a voyage and the owner is compensated by freight paid as hire. The shipowner pays for his crew and for insurance on the ship. The charterer pays for fuel used, port charges, and all cargo expenses. Regular lines often charter on this basis to supplement their fleet when the volume of cargo requires.

(c) *Bareboat/demise*. In this case the full responsibility for the ship is transferred to the charterer, who of course pays a much reduced monthly hire for the ships, as, unlike an ordinary time charter, he must also pay for the ship's operating costs, i.e. crew's wages, insurance, repairs, etc. This form of charter is most often used in leasing arrangements, where large financial organizations may order a ship and then demise charter it to an operator for its life at a rate of hire which will pay out their investment.

CLAUSES OF CHARTER PARTIES

Details of voyage charter parties

The Form scrutinized was the NANYOZAI Charter Party, (see annex I) Issued by the Japan Shipping Exchange.

The preamble covers details of charterer, shipowner, and vessel, present position and class (the latter two details for charterers' insurance requirements). They are the shipowner's warranties at date of fixing. Cubic capacity can be added if relevant — normally deadweight capacity is sufficient.

1. *Destination*. Covers loading details and, in this respect, the terminology has specific meanings:

"Covenient": reasonable speed

"Loading at": either named port or range

"Safe port": safe for the vessel both on arrival and departure

"Safe aground": must be the custom of the port for vessels of similar size

"Safe": during reasonably bad weather (includes

safe holding ground at anchor within port limits)

2. *Freight payments*. Usually prepaid, requiring charterer's insurance, otherwise straightforward.

3. *Loading and discharging* — Cover lay time

This particular charter party provides for an average loading rate for the vessel per day rather than lay-days. In this connection, a "weather working day" can be defined as any day upon which weather allows work to be done, irrespective of whether cargo is available to work or not. It can be expressed as:

Hours of bad weather	} Related to 24 hours
Hours of normal ports working and normal overtime	

The weather concept extends to suitability of cargo working in adverse conditions for individual commodity. Working days are continuous unless specifically excepted (e.g. Sundays and public holidays) and then exceptions should be precise. The addition of "whether worked or not" will have the effect of time not counting, and "unless

used" will mean time counts if work done on excepted days. If nothing is provided for in a C/P, notice of readiness must be given for loading, but not for discharge. This can only be given, if, in fact, the vessel is ready to the extent that the shipper actually requires it to be so — not unreasonably so. An ETA is useful but not a substitute for notice of readiness. Specific port authority instructions may override the joint intentions of both parties, in which case joint alternative action is usually taken with the shipper and shipowner sharing the costs involved. "Custom of the port" can be supervened in charter party, but it is adopted if not specifically included to the contrary. Custom is not Law.

4. *Demurrage and dispatch money.* Demurrage is a payment for liquidated damages payable by the charterer to the shipowner if loading or discharging is delayed beyond the agreed number of days. Normally it is payable after loading and/or after discharge, but it could be daily. "Once on demurrage, always on demurrage." When lay days expire, all subsequent time is on demurrage without exception, i.e. Sundays and public holidays etc. count. Strikes are a hazard to charterer if they occur after demurrage starts.

Dispatch money is the opposite of demurrage. It is a form of reward to the charterer for loading or discharging in less than the time allowed. The rate is usually $\frac{1}{2}$ or $\frac{1}{3}$ of the demurrage rate.

Lay days for loading and discharge can be combined, in which case demurrage or dispatch is only calculated after both operations have been completed. Thus, a delay in loading can be compensated by a saving of time in discharging.

5. *F.i.o. — free in and out to shipowner.* The charterer in this case pays the cost of loading, stowing and discharge. *F.o.b. — free on board* — does not cover stowage and stowage costs — including trimming. It can be a significant factor and should be specified.

In loose terms, f.i.o. is a "nett charter", whereas a "gross charter" implies loading and discharging costs borne by the shipowner and must be specified in the charter party.

6. *Overtime* — Self-explanatory.

7. *Deck cargo* — At the charterer's option, but cargo stowed on deck involves a lesser liability on behalf of the shipowner.

8. and 9. *Laydays and commencement.*

"Not to commence before". Work cannot commence even if ready to load, unless the charterer is agreeable. On the question of the cancelling date, strictly speaking the

ship must still proceed to the loading port and be present for loading, even if it is obvious that it cannot make the cancelling date, which is at the charterer's option. In practice, communication between the parties will decide whether the ship will still load even if taken or whether the contract is now void — at the charterer's option.

10. *Owners responsibilities and exemptions.* A standard format, known as the Hague Rules, have been adopted in this C/P which apply to bills of lading. Mere reference to the "Hague Rules to apply" is insufficient.

"Act of God" To claim such, a shipowner must establish a plea to the effect that it was caused without human intervention. It could not have been anticipated with reasonable foresight. It is not up to the charterer to disprove it if it is for the owners' benefit in the C/P — "he who asserts must prove."

"Seaworthiness is a question of fact, difficult to define. "Due diligence" qualifies absolute seaworthiness.

11. Responsibility for cargo may conflict with the owners' responsibilities in general, but this is for limited reasons only, and hence overriding.

13. *Deviation.* If unlawful, it voids contract; but reasonable deviation (e.g. to save life) must be accepted — as also safety of ship in adverse weather etc.

14. *Liens.* Liens are to protect the shipowner against non-payment of freight, but must be physically possible to be effective.

15. Self-evident.

16. "Master to sign bills of lading as presented without prejudice to C/P" — owners beyond agreed responsibilities in charter party.

17. General average — an example of the joint venture — full explanation is an insurance item.

18. *Agents.* Whether or not the charterers have the right to nominate the port agents, those agents are the agents of the ship.

19. *Strike clause.* Somewhat lengthy and attempts to cover all possibilities. Subject to litigation and a variety of interpretations.

20. *General war clause* — hopefully unused.

21. *Collision clause* — Very complicated and involved but mainly an insurance problem.

22. *Indemnity* — as shown, merely a statement of fact. Any attempt to limit liability to a set amount (e.g. freight) has no legal affect.

23. *Sub-letting.* If the charterer sub-lets, he remains responsible to the charterers and cannot pass on any responsibilities.

24. *Arbitration* — to be covered later.

POSSIBLE DISPUTES ARISING UNDER CONTRACTS OF AFFREIGHTMENT (i.e. Charter parties and bills of lading)

In general, disputes can largely be avoided if:

1. "*Charterers agents*" — the loose term used in negotiation meaning that the charterer has the right to nominate the port agents.

In principle, no matter from whose hands the port agent receives his appointment, he is the agent of the ship

and must ensure that the interests of the shipowner are safeguarded. Of course he may also act for the shipper/receiver for purposes of bringing cargo to/taking cargo from the ship, but his duties to the ship do not vary.

2. *Representation of facts, without checking*

Essential terms in the charter party (such as notice of readiness) if proved wrong can invalidate a charter party. Breaches of warranty of lesser importance can lead to damages but not cancellation. So facts should be checked and no assumptions made.

3. "Expected to load about on" — means that, according to the information which is *or ought to be* available to the shipowner, he honestly believes the ship will be ready to load about the date stated.

4. *The exceptions clause* — When referring to exceptions, the term "all other courses beyond the control of charterers" must be of like kind to those already specified — not everything. If the word "whatsoever" is used, no individual exceptions need to be mentioned. If exceptions are particularized, those not mentioned are excluded.

5. *Lay-time* — Unless specially mentioned to the contrary, Saturday is not a holiday. Also, time used before commencement of lay-time does not count in the United Kingdom, but in Germany and France it counts 50/50 because it benefits equally shipowner and charterer.

Holidays should be specified as local or otherwise.

6. *Payment of freight* — If the recipient is not specifically mentioned, it is payable to the owner. Thus, if it is then paid to an intermediary who fails to pass it on, there is a breach of contract on the part of the charterer and freight is liable to be paid again. It pays to specify who is the recipient, i.e. owner, broker, bank, etc.

7. *Demurrage* — Is not pro-rata, unless specified, otherwise part days count as whole days.

8. *Brokerages* — Only payable on freight, unless otherwise specified, i.e. "on freight also on dead freight and demurrage if any". In the case of, for example, mutual cancellation of charter parties, there may be no brokerage payable, again unless specified.

9. "*Demurrage payable by receivers/shippers*" — As receivers are not party to the contract, this is usually interpreted to mean that the charterer is promising to the shipowner that shippers are responsible for demurrage at port of loading and receivers at port of discharge — should they fail to do so the charterer remains responsible.

10. *Shipbrokers responsibility to third party* — A port agent can take responsibility on the owners' behalf, but unless it specifies "on owners' behalf", he may find himself liable.

11. *Stowage factors* — There is a difference between "stowage" and "measurement". "Measurement" is actual cubic measurement of cargo in cubic metres (or cubic feet). "Stowage" is the "stowage factor" — the figure which expresses the number of cubic metres or feet which a ton of cargo will *occupy in a ship*. Because of broken stowage, this figure can vary in different parts of a ship due to the ships shape, particularly for angular or cased goods. Thus, a quoted figure is normally the fair average.

12. "*Or substitute*" — The substitute should be "equivalent" or "similar".

13. "*Range of ports*" — Hamburg/Antwerp "inclusive" if these two ports are meant to be included in the range.

14. "*At least*" or "*not less than*" so many days — means clear days, not ports of days.

15. *Consecutive voyages* — Such a charter party is a single contract and, if the cancelling date for the first voyage is not met, it could cancel the whole series of voyages.

16. *Right of withdrawal under a time charter*^{1/} — If one party is in breach of the contract it does not absolve the other. If both are in breach, counter claims ensue.

17. *Speed and consumption warranties in a time charter*. These are frequent causes of dispute. It should be remembered there is no continuous warranty unless specified. (N.B. Tanker charter parties usually contain continuous warranties.)

18. "*Suitable for grab discharge*" — Also the cause of disputes. The charterer will consider it means "with no extra time or expense." The owners will consider that mere suitable is sufficient. Therefore, it should go on to state for whose account is any extra time/expense resulting from the construction of the ship.

19. *Deadfreight* (Lack of full cargo from charterer) — The shipowner has a claim for damages against the charterer but has no lien on the cargo unless specified. Then the damages must be proved. Note also that, in a so-called "gross terms" charter (i.e. where owner pays loading and discharging costs), the owner can only claim net loss short revenue less non-incurred expenditure. He cannot expect to be better-off as a result of deadfreight.

20. *Time sheets* — At remote, inexperienced ports, calculations made by agents may be in error. If so, they are not binding if they are not in accord with the terms of the charter party. It is best for such an agent to stick merely to a statement of facts. If time sheet calculations are performed, they should be signed "subject to charter party terms".

21. *Bills of lading* — A charter party is a contract between shipowner and charterer from which a bill of lading emerges. The bill of lading can be a document of title, when it is sold or endorsed to a third party. When such endorsement is made, the umbilical link between the B/L and the C/P is severed and the bill of lading is on its own. So that a new contract (which is contemplated by the C/P) springs up between shipowner and B/L holder, but, unless so stipulated, the charter party remains a contract between shipowner and charterer. It should be clearly stated that, for example, "All terms, conditions, clauses, liberties and exceptions of charter party dated... are hereby incorporated" since, for example, a condition is not an exception. The arbitration clause under a C/P does not, from its wording, automatically apply to a B/L, so that, if an arbitration clause is wanted it should be added in the B/L.

22. *Law applied* — It is desirable to state in the C/P which law will apply in case of disputes. Otherwise, the courts will have to discover from the facts by which law they think two parties intended to be bound. The flag of the ship will be a strong presumption in cases involving the Master's duty towards the cargo.

23. *Arbitration* — Courts of Arbitration have been available for many years. The Arbitration Act of 1950 specifies procedures in the United Kingdom if the parties have not themselves particularized and if the arbitration takes place in the United Kingdom.

^{1/} The shipowner has no *right* to withdraw the ship for late payment of hire due to the ship's construction.

Shipping Exchanges

Basically, they are markets where people meet to exchange views and information leading to business for their mutual benefit.

Example The Japan Shipping Exchange started in 1921 in Kobe, and covering shipowners, shipbrokers, bankers, maritime underworkers, and shipbuilders. It has a policy of promotion of "fraternal feelings". It now has a wide range of activities, including arbitration, mediation, valuation, expert opinions, contracts, investigation and statistics.

The Baltic Exchange — London

Full title: *The Baltic and Mercantile Shipping Exchange*

Historical:

The Baltic Mercantile and Shipping Exchange, known in shipping circles as "the Baltic," has, as its primary function, the provision of facilities for the fixing of cargoes for merchant vessels. It originated from the use of seventeenth century London's coffee-houses as business premises by ships' captains and merchants. Foremost among these establishments were the Jerusalem Coffee House and the Virginia and Maryland Coffee House, known from 1744 onward as "the Virginia and Baltic." The Virginia and Baltic was so named because the varied merchandise dealt with there came mostly from the plantations of the American colonies or from the countries of the Baltic seaboard. The proprietors of the coffee-houses provided newspapers and commercial information for their patrons besides refreshments and it was quite usual for a saleroom to be on the premises where cargoes were auctioned. Sale at the auctions were 'by the candle', bids continuing until the inch of candle burnt itself out.

By 1810, the increase in the volume of business made it necessary for the Baltic to take larger premises, and the Antwerp Tavern in Threadneedle Street was acquired and renamed "the Baltic." At about this time, tallow had attained outstanding importance, particularly in the trade which Britain had with the Baltic countries and with Russia. Primarily to control this dominant trade in tallow, a committee of Baltic members drew up and published in 1823 rules and regulations for the 'Baltic Club'. These rules limited membership to 300^{L/}, established a committee to control the Baltic's affairs and decreed that a dining-room and a sale-room be provided, and 'that wine, tea, coffee, chocolate and sandwiches be furnished in the coffee-room'.

From this point onwards, the membership and importance of the Baltic grew steadily. Although the 'Ton Tallow' continued as the basis of freight until 1890, the importance of the tallow trade diminished as other means of lighting were developed, and in its place the grain trade came to predominance. This process was accelerated

^{L/} There are now 700 limited companies, with some 2,400 individuals representing member companies who are entitled to use the Exchange.

by the repeal of the Corn Laws in 1846, marking recognition by Parliament that the answer to Britain's grain shortage was not protection but importation of foreign grain at economic prices. When the grain trade was added to the Baltic's activities, the time could scarcely have been foreseen when Britain would be compelled to import much of its grain from overseas, and when it would become one of the principal commodities with which the shipping world would concern itself.

Administration

The Baltic is now a Limited Company with a Board of Directors. It is non-profit making but has income from property and subscriptions to cover expenses.

Membership is open to individuals in their own right and also the representatives of appropriate companies. Each has to have a minimum of 10 qualifying shares. A member can have as many clerks as he wishes. Before election, the names of new members and clerks seeking membership must be posted for 14 days. Membership is in two classes: broker members and principal members.

At present, there are some 2,500 members and clerks, and 600/700 is the average daily attendance. The sessions are approximately 12.00-1.45 p.m. and 4.00-4.30 p.m. — at other times members are in their opens etc.

The principal activities on the Baltic are now the freight market for the chartering of ships, sale and purchase of grain, grain futures, sale and purchase of ships and aircraft chartering — all on a world-wide basis.

The aims of the Baltic are to supply a sophisticated, speedy and highly-principled market. The Board has no direct responsibility for the business conducted on the floor, apart from an interest in maintaining standards and integrity. There are fifteen Board members, seven from chartering and seven from grain, plus a Chairman. Three "floor" directors among the fifteen are nominated from the "floor", i.e. from among the general membership.

The Board has powers of censure, suspension or expulsion under Rule 34 for actions contrary to the high standards maintained. The market rests on:

(a) *Freedom*: free competition among members, free competition with other markets, freedom for owners or charterers to choose brokers of their choice, or to deal direct. A broker acts both as a cushion between owner and charterer and as a source of information and advice. He aims to provide the service which brings together shipowners and merchants. He also acts as port agent for ships and as sales and purchase broker. Since 1969, the international body of shipbrokers, FONASBA, has linked with international bodies concerned in shipping.

National associations of shipbrokers qualify for membership and at present 19 countries are represented. FONASBA has consultative status with UNCTAD. It has co-operated in the production of the NORGRAIN charter party replacing the Baltimore Form C is currently looking at the New York Produce Form, and attended the INTERTANKO Working Committee on the INTER-

TANKVOY charter party. It has produced standard liner agency agreements.

(b) *Communications*: speedy and accurate gathering and dissemination of all relevant information. Also between brokers and their own offices while on the floor. (Bleepers!)

(c) *Agglomeration*: The "jelling" of a large number of people together produces a "market feeling."

(d) *Trust entailing contracts* — to be made verbally in the first instance.

The Board meets on alternate Tuesdays to rule on policy matters etc. A Secretary and staff handle routine matters.

A broker's revenue is by way of brokerage, and the Board frowns on any attempt to undercut whatever is outside the market. Brokers representing charterers can and sometimes do issue circulars of cargoes offering to speed up dissemination of this information. Agents representing owners do not prepare shipping lists.

The Baltic itself does not record fixings, but naturally there is a flow of information from broker to client. In addition, the press (e.g. Lloyds List) publish most fixtures with their own reporters on the floor. Further longer-term trends and statistics are published monthly.

Brokers' errors fall into two categories; those involving negligence within the broker's office and those that occur with no blame attached. In either case, when such errors are discovered, all parties must seek to resolve the impasse by rechartering, agreeing to compromise etc., but, if unsuccessful, the broker may be liable in the case of his own negligence even if the contract is still only in the verbal stage. Most chartered shipbrokers are members of the Chartered Shipbrokers P & I Association, which offers protection in cases of negligence. Where the fault lies outside the responsibility of the parties (e.g. a breakdown in communications), then no contract exists, there is no breach of warranty and all parties must start again. In cases of ambiguity, a broker must act in accordance with what is reasonable in the circumstances.

Brokers can have interests in other concerns, shipping or otherwise.

Instructions to "fix on best possible terms" is sometimes liable to put the broker in a precarious position. The broker will always endeavour to do so anyway, but the final decision must rest with the owner or charterer.

The ethical dimension

The Baltic motto of "Our word our bond" not only makes good business sense, but the practice of verbal

fixing speeds the whole chartering process. The charter party merely sets down what has already been agreed verbally. Action (e.g. routing or re-routing of vessels) takes place immediately after the verbal fixture.

In English law, offers may be withdrawn prior to acceptance provided no "consideration" has passed, i.e. no payment or deposit to keep the offer open.

On the Baltic, this would not be acceptable. An offer is made firm for a stated period of time and should not be withdrawn until the expiration of that stated period, unless there is agreement from the other party. It is not ethical to withdraw an offer which has been made with a time limit until that time limit has expired. In the process of international communication, this an essential element in allowing the time difference in different parts of the world to be catered for and each party to have time to consider his next actions. Thus, an offer made from London at the end of a business day to a Japanese charterer would be made for instance for reply noon London time the following day. This, by reason of the time difference, allows communication both ways to be provided for and the principals in, say, Tokyo to discuss their reply to the offer during their business day.

Offers "subject to" are deprecated, as it permits attack on the basic concept of the market. United Kingdom law does not recognize an agreement to agree. The offer should be:

- (a) Specific as to price and terms;
- (b) Binding on the person making it;
- (c) Limited in time.

Anything else is an 'invitation to treat' or an 'indication'; thus, an offer "subject to details" is only an initial exploration between parties anxious to finalize. It is not a contract.

An offer "subject to stein", means subject to cargo availability. Broadly speaking, the greater the freedom of a market, the less need to encumber it with officialdom, regulations etc.

Attempting to look ahead into the future, it is probable that, in the major sea-going trades in the world, there will gradually become fewer and larger charterers on the one hand and a corresponding reduction in the numbers of shipowners on the other, either by way of mergers between companies or by the further development of trading consortia. This increase in scale makes the effective role of the broker more difficult, because direct contact between a large charterer and a large operator to contract for high-volume movement is bound to increase. Still, an intelligent intermediary in the negotiation of business can be of enormous value to both sides, and, although the broking fraternity itself will have to adapt as it is already doing to the changing pattern of trade, the efficient broker will continue to prosper.

THE BALTIC AND INTERNATIONAL MARITIME CONFERENCE

(Formerly The Baltic and White Sea Conference.)

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Amended 1/3/1930.
Amended 1/1/1950.

UNIFORM TIME-CHARTER

Code-Name
Baltime
1939.

	19
Description of Vessel.	of the Vessel called classed of carrying about of bunkers stores, provisions and boiler water, having as per builder's plan grain capacity, exclusive of permanent bunkers which contain about bale of steaming about knots in good weather and smooth water on a consumption of about tons best Welsh coal, or about tons oil-fuel, now	Owners Register, indicated horse power, summer freeboard inclusive cubic-feet and fully loaded capable
Charterers.	aud of	7 8 9
Period.	1. The Owners let, and the Charterers hire the Vessel for a period of calendar months from the time (not a Sunday or a legal Holiday unless taken over) the Vessel is delivered and placed at the disposal of the Charterers between 9 a.m. and 6 p.m., or between 9 a.m. and 2 p.m. if on Saturday, at	Charterers, as follows: 10 11 12 13
Port of Delivery.	in such available berth where she can safely lie always afloat, as the Charterers may direct, she being in every way fitted for ordinary cargo service.	14 15
Time for Delivery.	The Vessel to be delivered 2. The Vessel to be employed in lawful trades for the carriage of lawful merchandise only between good and safe ports or places where she can safely lie always afloat within the following limits :	16 17 18
Owners to provide.	No live stock nor injurious, inflammable or dangerous goods (such as acids, explosives, calcium carbide, ferro silicon, naphtha, motor spirit, tar, or any of their products) to be shipped. 3. The Owners to provide and pay for all provisions and wages, for insurance of the Vessel, for all deck and engine-room stores and maintain her in a thoroughly efficient state in hull and machinery during service. The Owners to provide one winchman per hatch. If further winchmen are required, or if the stevedores refuse or are not permitted to work with the Crew, the Charterers to provide and pay qualified shore-winchmen.	19 20 21 22 23 24
Charterers to provide.	4. The Charterers to provide and pay for all coals, including galley coal, oil-fuel, water for boilers, port charges, pilotages (whether compulsory or not), canal steersmen, boatage, lights, tug-assistance, consular charges (except those pertaining to the Master, Officers and Crew) canal, dock and other dues and charges, including any foreign general municipality or state taxes, also all dock, harbour and tonnage dues at the ports of delivery and re-delivery (unless incurred through cargo carried before delivery or after re-delivery) agencies, commissions, also to arrange and pay for loading, trimming, stowing and delivery of cargoes, surveys on hatches, meals supplied to officials and men in their service and all other charges and expenses whatsoever including detention and expenses through quarantine (including cost of fumigation and disinfection).	25 26 27 28 29 30 31
Bunkers.	All ropes slings and special runners actually used for loading and discharging and any special gear, including special ropes, hawsers and chains required by the custom of the port for mooring to be for the Charterers' account. The Vessel to be fitted with winches, derricks, wheels and ordinary runners capable of handling lifts up to 2 tons. 5. The Charterers at port of delivery and the Owners at port of re-delivery to take over and pay for all coal or oil-fuel remaining in the Vessel's bunkers at current price at the respective ports. The Vessel to be re-delivered with not less than tons and not exceeding tons of coal or oil-fuel in the Vessel's bunkers.	32 33 34 35 36 37
Hire.	6. The Charterers to pay as hire :	38
Payment.	per 30 days, commencing in accordance with clause 1 until her re-delivery to the Owners. Payment of hire to be made in cash, in without discount, every 30 days, in advance.	39 40
	In default of payment the Owners to have the right of withdrawing the Vessel from the service of the Charterers, without noting any protest and without interference by any court or any other formality whatsoever and without prejudice to any claim the Owners may otherwise have on the Charterers under the Charter.	41 42 43

Re-delivery.	7. The Vessel to be re-delivered on the expiration of the Charter in the same good order as when delivered to the Charterers (fair wear and tear excepted) at an ice-free port in the Charterers' option in	44 45
	between 9 a.m. and 6 p.m., and 9 a.m. and 2 p.m. on Saturday, but the day of re-delivery shall not be a Sunday or legal Holiday.	46 47
Notice.	The Charterers to give the Owners not less than ten days' notice at which port and on about which day the Vessel will be re-delivered.	48 49
	Should the Vessel be ordered on a voyage by which the Charter period will be exceeded the Charterers to have the use of the Vessel to enable them to complete the voyage, provided it could be reasonably calculated that the voyage would allow re-delivery about the time fixed for the termination of the Charter, but for any time exceeding the termination date the Charterers to pay the market rate if higher than the rate stipulated herein.	50 51 52
Cargo Space.	8. The whole reach and burthen of the Vessel, including lawful deck-capacity to be at the Charterers' disposal, reserving proper and sufficient space for the Vessel's Master, Officers, Crew, tackle, apparel, furniture, provisions and stores.	53 54
Master.	9. The Master to prosecute all voyages with the utmost despatch and to render customary assistance with the Vessel's Crew. The Master to be under the orders of the Charterers as regards employment, agency, or other arrangements. The Charterers to indemnify the Owners against all consequences or liabilities arising from the Master, Officers or Agents signing Bills of Lading or other documents or otherwise complying with such orders, as well as from any irregularity in the Vessel's papers or for overcarrying goods. The Owners not to be responsible for shortage, mixture, marks, nor for number of pieces or packages, nor for damage to or claims on cargo caused by bad stowage or otherwise.	55 56 57 58 59 60
	If the Charterers have reason to be dissatisfied with the conduct of the Master, Officers, or Engineers, the Owners, on receiving particulars of the complaint, promptly to investigate the matter, and, if necessary and practicable, to make a change in the appointments.	61 62 63
Directions and Logs.	10. The Charterers to furnish the Master with all instructions and sailing directions and the Master and Engineer to keep full and correct logs accessible to the Charterers or their Agents.	64 65
Suspension of Hire, etc.	11. (A) In the event of drydocking or other necessary measures to maintain the efficiency of the Vessel, deficiency of men or Owners' stores, breakdown of machinery, damage to hull or to her accident, either hindering or preventing the working of the vessel and continuing for more than twenty-four consecutive hours, no hire to be paid in respect of any time lost thereby during the period in which the Vessel is unable to perform the service immediately required. Any hire paid in advance to be adjusted accordingly.	66 67 68 69
	(b) In the event of the Vessel being driven into port or to anchorage through stress of weather, trading to shallow harbours or to rivers or ports with bars or suffering an accident to her cargo, any detention of the Vessel and/or expenses or the cause by reason of which either is incurred, be due to, or be contributed to by, the negligence of the Owners' servants.	70 71 72 73
Cleaning Bollers.	12. Cleaning of boilers whenever possible to be done during service, but if impossible the Charterers to give the Owners necessary time for cleaning. Should the Vessel be detained beyond 48 hours hire to cease until again ready.	92 93
Responsibility and Exemption.	13. The Owners only to be responsible for delay in delivery of the Vessel or for delay during the currency of the Charter and for loss or damage to goods on board, if such delay or loss has been caused by want of due diligence on the part of the Owners or their Manager in making the Vessel sea-worthy and fitted for the voyage or any other personal act or omission or default of the Owners or their Manager. The Owners not to be responsible in any other case nor for damage or delay whatsoever and howsoever caused even if caused by the neglect or default of their servants. The Owners not to be liable for loss or damage arising or resulting from strikes, lock-outs or stoppage or restraint of labour (including the Master, Officers or Crew) whether partial or general.	94 95 96 97 98 99 100
	The Charterers to be responsible for loss or damage caused to the Vessel or to the Owners by goods being loaded contrary to the terms of the Charter or by improper or careless bunkering or loading stowing or discharging of goods or any other improper or negligent act on their part or that of their servants.	101 102 103
Advances.	14. The Charterers or their Agents to advance to the Master, if required, necessary funds for ordinary disbursements for the Vessel's account at any port charging only interest at 6 per cent, p.a., such advances to be deducted from hire.	104 105
Excluded Ports.	15. The Vessel not to be ordered to nor bound to enter : (a) any place where fever or epidemics are prevalent or to which the Master, Officers and Crew by law are not bound to follow the Vessel (b) any ice-bound place or any place where lights, lightships, marks and buoys are or are likely to be withdrawn by reason of ice on the Vessel's arrival or where there is risk that ordinarily the Vessel will not be able on account of ice to reach the place or to get out after having completed loading or discharging. The Vessel not to be obliged to force ice. If on account of ice the Master considers it dangerous to remain at the loading or discharging place for fear of the Vessel being frozen in and/or damaged, he has liberty to sail to a convenient open place and await the Charterers' fresh instructions.	106 107 108 109 110 111 112
Ice.	Unforeseen detention through any of above causes to be for the Charterers' account.	113
Loss of Vessel.	16. Should the Vessel be lost or missing, hire to cease from the date when she was lost. If the date of loss cannot be ascertained half hire to be paid from the date the Vessel was last reported until the calculated date of arrival at the destination. Any hire paid in advance to be adjusted accordingly.	114 115 116
Overtime.	17. The Vessel to work day and night if required. The Charterers to refund the Owners their outlays for all overtime paid to Officers and Crew according to the hours and rates stated in the Vessel's articles.	117 118
Lien.	18. The Owners to have a lien upon all cargoes and sub-freights belonging to the Time-Charterers and any Bill of Lading freight for all claims under this Charter, and the Charterers to have a lien on the Vessel for all moneys paid in advance and not earned.	119 120

Salvage.	19. All salvage and assistance to other vessels to be for the Owners' and the Charterers' equal benefit after deducting the Master's and Crew's proportion and all legal and other expenses including hire paid under the charter for time lost in the salvage, also repairs of damage and coal or oil-fuel consumed. The Charterers to be bound by all measures taken by the Owners in order to secure payment of salvage and to fix its amount.	121 122 123 124
Sublet.	20. The Charterers to have the option of subletting the Vessel, giving due notice to the Owners, but the original Charterers always to remain responsible to the Owners for due performance of the Charter.	125 126
War.	21. (a) The Vessel unless the consent of the Owners be first obtained not to be ordered nor continue to any place or on any voyage nor be used on any service which will bring her within a zone which is dangerous as the result of any actual or threatened act of war, war, hostilities, warlike operations, acts of piracy or of hostility or malicious damage against this or any other vessel or its cargo by any person, body or State whatsoever, revolution, civil war, civil commotion or the operation of international law, nor be exposed in any way to any risks or penalties whatsoever consequent upon the imposition of Sanctions, nor carry any goods that may in any way expose her to any risks of seizure, capture, penalties or any other interference of any kind whatsoever by the belligerent or fighting powers or parties or by any Government or Ruler. (b) Should the Vessel approach or be brought or ordered within such zone, or be exposed in any way to the said risks, (1) the Owners to be entitled from time to time to insure their interests in the Vessel and/or hire against any of the risks likely to be involved thereby on such terms as they shall think fit, the Charterers to make a refund to the Owners of the premium on demand; and (2) notwithstanding the terms of clause 11 hire to be paid for all time lost including any loss owing to loss of or injury to the Master, Officers, or Crew or to the action of the Crew in refusing to proceed to such zone or to be exposed to such risks. (c) In the event of the wages of the Master, Officers and/or Crew or the cost of provisions and/or stores for deck and/or engine room and/or insurance premiums being increased by reason of or during the existence of any of the matters mentioned in section (A) the amount of any increase to be added to the hire and paid by the Charterers on production of the Owners' account therefore, such account being rendered monthly. (d) The Vessel to have liberty to comply with any orders or directions as to departure, arrival, routes, ports of call, stoppages, destination, delivery or in any other wise whatsoever given by the Government of the nation under whose flag the Vessel sails or any other Government or any person (or body) acting or purporting to act with the authority of such Government or by any committee or person having under the terms of the war risks insurance on the Vessel the right to give any such orders or directions. (e) In the event of the nation under whose flag the Vessel sails becoming involved in war, hostilities, warlike operations, revolution, or civil commotion, both the Owners and the Charterers may cancel the Charter and, unless otherwise agreed, the Vessel to be re-delivered to the Owners at the port of destination or, if prevented through the provisions of section (A) from reaching or entering it, then at a near open and safe port at the Owners' option, after discharge of any cargo on board. (f) If in compliance with the provisions of this clause anything is done or is not done, such not to be deemed a deviation.	127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156
Section (C) is optional and should be deleted unless agreed.		
Cancelling.	22. Should the Vessel not be delivered by the day of 19 the Charterers to have the option of cancelling. If the Vessel cannot be delivered by the cancelling date, the Charterers, if required, to declare within 48 hours after receiving notice thereof whether they cancel or will take delivery of the Vessel.	157 158 159 160
Arbitration.	23. Any dispute arising under the Charter to be referred to arbitration in London (or such other place as may be agreed) one Arbitrator to be nominated by the Owners and the other by the Charterers, and in case the Arbitrators shall not agree then to the decision of an Umpire to be appointed by them, the award of the Arbitrators or the Umpire to be final and binding upon both parties.	161 162 163 164
General Average.	24. General Average to be settled according to York Antwerp Rules, 1974. Hire not to contribute to General Average.	165 166
Commission.	25. The Owners to pay a commission of to on any hire paid under the Charter, but in no case less than is necessary to cover the actual expenses of the Brokers and a reasonable fee for their work. If the full hire is not paid owing to breach of Charter by either of the parties the party liable therefore to indemnify the Brokers against their loss of commission. Should the parties agree to cancel the Charter, the Owners to indemnify the Brokers against any loss of commission, but in such case the commission not to exceed the brokerage on one year's hire.	167 168 169 170 171

Adopted by
the Documentary Committee
of the Chamber of Shipping
of the United Kingdom.

RECOMMENDED

Code Name: Issued to come into force for fixtures on and after 15th September 1972.
Gencon.

The Documentary Council of The Baltic and White Sea Conference.

(Baltic and International Maritime Conference)

UNIFORM GENERAL CHARTER

AS REVISED 1922

(only to be used for trades for which no approved form is in force)

Owners. 19
1. IT IS THIS DAY MUTUALLY AGREED between

Issued 13/2/1960
Amended 4/4/1976

CODE NAME
NANYOZAI
1967

Copyright.
Published by The Japan
Shipping Exchange, Inc.

The Documentary Committee of The Japan Shipping Exchange, Inc.
NANYOZAI CHARTER PARTY

19

Owners, Vessel,
Position, Charterers

IT IS THIS DAY MUTUALLY AGREED between 1
..... as Owners/Chartered Owners of the 2
Steamer/Motor Vessel built 3
of tons ^{GROSS} Register and carrying about tons of 4
Deadweight cargo, classed , now 5
and expected ready to load under this Charter about 6
and as Charterers. 7

Where to load,
Cargo, Destination

1. That the said vessel shall, with all convenient speed, sail and proceed to 8
..... as ordered by Charters or so near thereto as she may safely get 9
and lie always afloat, and there load, with her own tackle, a full and complete/part cargo of Logs 10
Board Measure Feet/Cubic Meters % more or less at Owners' option, which Charterers bind 11
themselves to ship, and being so loaded the vessel shall, with all convenient speed, proceed to 12
..... as ordered by Charters or so near thereto as she may safely get and lie always 13
afloat and there deliver the said cargo in the customary manner. 14

Freight

2. Freight to be prepaid on Bills of Lading quantity as follows: 15
..... 16
..... 17
..... 18
..... 19
Freight to be considered as earned upon completion of loading, vessel and/or cargo lost or not lost. 20

Loading and
Discharging

3. Cargo to be loaded at the average rate of Board Measure Feet/Cubic Meters per weather 21
working day of 24 consecutive hours, Sundays and Holidays and Holidays excepted unless used. 22
Lay days to commence at 1 p.m. if notice of readiness to load is given at or before noon and at 6 a.m. next 23
working day if notice given after noon unless worked sooner whereupon lay days to begin. 24
Notice of readiness at loading port(s) to be given during office hours to 25
..... 26
Cargo to be discharged at the average rate of Board Measure Feet/Cubic 27
Meters per weather working day of 24 consecutive hours, Sundays excepted unless used. 28
Lay days to commence at 1 p.m. if notice of readiness to discharge is given at or before noon and at 6 a.m. 29
next working day if notice given after noon unless worked sooner whereupon lay days to begin. 30
Notice of readiness at discharging port(s) to be given during office hours to 31
..... 32

Demurrage and
Despatch Money

Time lost in waiting for berth to count as lay days. 33
Lay days for loading and discharging to be non-reversible. 34
Rotation of loading and discharging ports to be at Owners' option. 35
4. Demurrage to be paid to Owners at the rate of US \$ per day of 24 36
running hours or pro rata for any part thereof, payable day by day, for all time used in excess of lay days at loading 37
or discharging port(s). Despatch Money to be paid to Charterers at the rate of US \$ 38
per day of 24 running hours or pro rata for any part thereof for lay days saved at loading or discharging port(s). 39
Demurrage and/or Despatch Money at loading port(s) to be settled in 40
..... and at discharging port(s) to be settled in 41
..... 42

Free In and Out

5. Charterers to load, stow and discharge the cargo free of risks and expenses to Owners. Charterers to have 43
the liberty of working all available hatches. The vessel to provide motive power, winches, gins and falls at all times 44
and, if required, to supply light for night work on board free of expenses to Charterers. 45

Overtime

6. Overtime for loading and discharging to be for account of the party ordering the same. If overtime be ordered 46
by Port Authorities or any other Governmental Agencies, Charterers to pay extra expenses incurred. Officers' 47
and crew's overtime always to be paid by Owners. 48

Deck Cargo

7. Owners to have the option to load cargo on deck at Charterers' risk within the limit of the vessel's 49
seaworthiness, in which case Owners not to be responsible for wash away and/or any other damage to on-deck cargo. 50

Days on Demurrage

8. days of 24 running hours on demurrage for loading to be allowed 51
Charterers at loading port(s). Should Charterers be unable to load within the above period, the vessel to have liberty 52
to sail with the cargo then on board, Charterers paying the dead-freight and demurrage incurred. 53

Commencement of

9. Lay days are not to commence before Should the vessel not be 54
ready to load (whether in berth or not) at or before noon of Charterers shall 55
have the option of cancelling this Charter, such option to be declared, if demanded, at least 48 hours before the 56
vessel's expected arrival at port of loading. 57

Owners' Responsibility	10. Owners shall, before and at the beginning of the voyage, exercise due diligence to make the vessel seaworthy and properly manned, equipped and supplied and to make the holds and all other parts of the vessel in which cargo is carried fit and safe for its reception, carriage and preservation. Owners shall properly and carefully handle, carry, keep and care for the cargo.	58 59 60 61
	Owners shall not be liable for loss of or damage to the cargo arising or resulting from: unseaworthiness, unless caused by want of due diligence on the part of Owners to make the vessel seaworthy, and to secure that the vessel is properly manned, equipped and supplied, and to make the holds and all other parts of the vessel in which cargo is carried fit and safe for its reception, carriage and preservation. Owners shall not be responsible for loss of or damage to the cargo arising or resulting from: act, neglect or default of the master, mariner, pilot, or the servants of Owners in the navigation or in the management of the vessel; fire, unless caused by the actual fault or privity of Owners; perils, dangers and accidents of the sea or other navigable waters; act of God; act of war; act of public enemies; arrest or restraint of princes, rulers or people, or seizure under legal process; quarantine restrictions; act or omission of Charterers or of the shippers or owners of the cargo, their agents or representatives; strikes or lock-outs or stoppage or restraint of labor from whatever cause, whether partial or general (provided that nothing herein contained shall be construed to relieve Owners from responsibility for their own acts); riots and civil commotions; saving or attempting to save life or property at sea; wastage in bulk or weight or any other loss or damage arising from inherent defect, quality or vice of the cargo; insufficiency of packing; insufficiency or inadequacy of marks; latent defects not discoverable by due diligence; any other cause arising without the actual fault or privity of Owners or without the fault of the agents or servants of Owners.	62 63 64 65 66 67 68 69 70 71 72 73 74 75 76
Responsibility for Cargo	11. Owners shall not be responsible for split, chafing and/or damage unless caused by the negligence or default of master or crew.	77 78
Stevedore Damage	12. Charterers are to be responsible for proved loss of or damage (beyond ordinary wear and tear) to any part of the vessel caused by stevedores at both ends. Such loss or damage, as far as apparent, to be reported by the Master to Charterers, their Agents or their stevedores within 24 hours after occurrence.	79 80 81 82
Deviation	13. The vessel has liberty to call at any port or ports en route, to sail without pilots, to tow and/or assist vessels in all situations, and to deviate for the purpose of saving life and/or property or for bunkering purposes or to make any reasonable deviation.	83 84 85
Owners' Lien	14. Owners shall have a lien on the cargo for all freight, dead-freight, demurrage, damages for detention, average and all every other sum of money which may become due to Owners under this Charter. Charterers shall remain responsible for above sum only to such extent as Owners have been unable to obtain payment thereof by exercising the lien on the cargo.	86 87 88 89
Measurement	15. Cargo to be measured by official measurers or sworn measurers according to Brereton Scale/Hoppus Scale before loading.	90 91
Bills of Lading	16. The Captain to sign Bills of Lading at such rate of freight as presented without prejudice to this Charterparty, but should the freight by Bills of Lading amount to less than the total chartered freight, the difference to be paid to Owners in cash on signing Bills of Lading.	92 93 94
General Average Agency	17. General average to be settled according to York-Antwerp Rules, 1950, in Tokyo.	95
Strike Clause	18. In every case Owners shall appoint their Agents both at loading and discharging port(s). 19. Neither Charterers nor Owners are responsible for the consequences of any strikes or lock-outs preventing or delaying the fulfilment of any obligations under this Charter. If there is a strike or lock-out affecting the loading of the cargo or any part of it at the time when the vessel must start on or during her voyage to the port(s) of loading, Charterers or Owners shall have the option of cancelling this Charter. If such strike or lock-out is going on at or occurs after the vessel's arrival at port(s) of loading, Charterers have the right either to keep the vessel waiting paying full demurrage or to cancel this Charter. Such cancellation to take place within 24 hours after the vessel's arrival or 24 hours after the subsequent occurrence of such strike or lock-out. If part of the cargo has then already been loaded, Owners must proceed with same if requested by Charterers, having liberty to complete with other cargo at the same loading port or any other nearby port(s) for their account. If there is a strike or lock-out affecting the discharge of the cargo at the time of the vessel's arrival at or off the port(s) of discharge, or occurring after the vessel's arrival, Charterers shall have the option of keeping the vessel waiting until such strike or lock-out is at an end against paying half the demurrage for the time the vessel is delayed or, of ordering the vessel to nearby safe port where she can safely discharge her cargo without risk of being detained by strike or lock-out, against paying all extra expenses incurred: such option to be declared within 36 hours after the arrival at or off the port(s) of discharge or the subsequent occurrence of the strike or lock-out. On delivery of the cargo at such port(s), all conditions of this Charterparty and of the Bill of Lading shall apply and the vessel shall receive the same freight as if she had discharged at the original port(s) of destination.	96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114
General War Clause	20. If the nation under whose flag the vessel sails should be engaged in war and the safe navigation of the vessel should thereby be endangered either party to have the option of cancelling this Charter, and if so cancelled, cargo already shipped shall be discharged either at the port(s) of loading or at the nearest safe place at the risk and expense of Charterers. If owing to outbreak of hostilities the cargo loaded or to be loaded under this Charter or part thereof become contraband of war whether absolute or conditional or liable to confiscation or detention according to international law or the proclamation of any of the belligerent powers, each party to have the option of cancelling this Charter as far as such cargo is concerned, and contraband cargo already loaded to be then discharged either at the port(s) of loading or at the nearest safe place at the expense of Charterers. Owners to have the right to fill up with other goods instead of the contraband. Should any port(s) where the vessel has to load under this Charter be blockaded, the Charter to be null and void with regard to the goods to be shipped at such port(s). No Bills of Lading to be signed for any blockaded port(s), and if the port(s) of destination be declared blockaded after Bills of Lading have been signed, Owners shall discharge the cargo either at the port(s) of loading,	115 116 117 118 119 120 121 122 123 124 125 126 127 128

	against payment of the expenses of discharge if the ship has not sailed thence or, if sailed, at any safe port(s) on the way as ordered by Charterers or if no order is given at the nearest safe place against payment of full freight.	129 130
Both-to-Blame	21. If the vessel comes into collision with another ship as a result of the negligence of the other ship and any act, neglect or default of the master, mariner, pilot or the servants of Owners in the navigation or in the management of the vessel, the owners of the cargo carried hereunder will indemnify Owners against all loss or liability to the other or non-carrying ship or her owners insofar as such loss or liability represents loss of or damage to, or any claim whatsoever of the owners of said cargo, paid or payable by the other or non-carrying ship or her owners as part owners of said cargo and set off, recouped or recovered by the other or non-carrying ship or her owners as part of their claim against the carrying vessel or Owners. The foregoing provisions shall also apply where the owners, operators or those in charge of any ship or ships or objects other than, or in addition to, the colliding ships or objects are at fault in respect to a collision or contact.	131 132 133 134 135 136 137 138 139
Indemnity	22. Indemnity for non-performance of this Charter shall be proved damages.	140
Sublet	23. Charterers shall have the option of subletting whole or part of the vessel, they remaining responsible for due fulfilment of this Charter.	141 142
Arbitration	24. Any dispute arising from this Charter shall be submitted to arbitration held in Tokyo by the Japan Shipping Exchange, Inc., in accordance with the provisions of the Maritime Arbitration Rules of the Japan Shipping Exchange, Inc., and the award given by the arbitrators shall be final and binding on both parties.	143 144 145
	This Charter Party has been signed by both parties and shall be in the custody of Owners.	146

MULTINATIONAL SHIPPING ENTERPRISES*

Definition

A multinational shipping enterprise is any joint venture undertaken by interests in two or more developing countries, with a possible participation of interests in developed countries (provided that the interests in developing countries maintain effective control) which provides transport of goods (including livestock) and/or passengers by sea.

The definition uses the criterion of ownership rather than that of management, which would exclude shipping enterprises whose management is subcontracted to a third party.

Transnational corporations and ventures established purely so that one of the partners takes advantage of fiscal, credit, labour or other facilities that might exist in the country of the other partners (e.g. flags of convenience) are excluded. The definition includes consortia.

Benefits of multinational shipping enterprises

If such shipping enterprises are to be successful, an essential condition is the provision of competent management and the existence of a spirit of goodwill, co-operation and compromise among the participants.

The possible benefits may vary according to the particular field of activities of the enterprise e.g. where liner of tramp shipping, tanker, bulk carrier or specialized shipping operations and, include the following:

(a) *Availability of capital.* Greater access to financial resources, or guarantees, for investment from several countries. Greater direct subsidies for the construction or purchase of vessels and their operation or of other forms of financial assistance. Possibility of more favourable credit facilities from international financial institutions, such as IBRD and regional banks.

(b) *Sharing of investments.* In view of the high cost of ships, whether new or second-hand, and of competing priorities for development among different sectors of the economy in developing countries, sharing of investment reduces the burden of establishing a shipping industry in individual developing countries.

(c) *Cost to the balance of payment.* Sharing of investment and operating costs among a number of developing countries reduces the burden on each individually.

(d) *Avoidance of excess capacity.* If each of a number of neighbouring developing countries operated its own national liner service, an excess capacity might result, especially in view of the terms of admission under which they have to join the conferences, and the need for a minimum number of vessels in the fleet in order to provide an adequate service. This risk can be avoided through a multinational shipping enterprise covering the ports of all members.

(e) *Sharing of commercial risks.* Risk of financial

losses from the operation of shipping enterprises is shared among the participants instead of being borne by single countries.

(f) *Recruitment of seagoing and managerial personnel.* A multinational shipping enterprise drawing on the manpower resources of several countries is better able than a national enterprise to meet its requirements locally for managerial, clerical and seagoing personnel.

(g) *Sources of cargo.* A multinational shipping enterprise can tap sources of cargo from more than one country and thus achieve economies of scale. This is important in liner shipping, but equally for services by special carriers for certain commodities. Possibility of extending sources of cargo through vertical integration, i.e. direct investment in the enterprise by interests of exporters in the countries concerned.

(h) *Operating costs.* By drawing on more sources of capital and of demand for shipping space, a multinational shipping company can use vessels of larger dead-weight capacity and operate a larger fleet than national enterprises, thus reducing operating costs per ton. The bargaining position of multinational shipping enterprises vis-à-vis suppliers of bunkers, stores and spare parts, as well as agents, is further strengthened and can lead to appreciable reductions in the price at which these items are purchased.

(i) *Competition in the market.* By achieving greater profitability, the multinational shipping enterprise is in a better position to withstand competition in case it decides to operate in competition with other companies, or to influence conference decisions in case it participates in the conference.

Problems connected with the establishment and operation of multinational shipping enterprises

A number of areas need to be considered by developing countries establishing multinational shipping enterprises so that potential problems can be avoided. These areas are:

(i) Objective and policy of the enterprise: the objective of the enterprise has to be decided at the outset, thus determining its field of activities. The partners must agree whether to operate on a purely commercial basis or approach the company as a public service.

(ii) National legislation conflicts may arise owing to divergence in the legislation of the potential members in respect of ownership of capital of a company, registration of vessels partly owned by foreign interests, employment of aliens ashore or at sea, legislation governing mortgage and liens on the vessels. Particular attention must be paid to the possibility of conflicts arising due to cargo reservation laws.

(iii) Incorporation and registration of enterprise. This question must be solved at the outset and depends on an agreement reached among the partners. An enterprise may be incorporated in one of the partners, have a registered office in each of the other's and hold meetings

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of the board of directors and of shareholders in rotation in each of the participating countries.

(iv) Registration of vessels. The number of vessels to be registered in each country may be either determined on the basis of equal share, i.e. equal number of ships in each country, or in proportion to the capital participation of each country. The first solution is suitable when the company fleet consists of a sufficiently large number of vessels and the shareholding of each partner is more or less equal.

(v) Fiscal regulations. There is need for harmonization of legislation on the tax liability of the company in each member country to avoid double taxation or sharp differences in the rate of taxes and other levies. Similarly harmonization may be necessary concerning the tax liability of the personnel.

(vi) Exchange controls. Flexibility must exist to allow the enterprise to transfer funds or profits, as necessary, from one country to another.

(vii) Recruitment of personnel. There is need to compromise between the desire of each member to employ its own personnel in the company and the needs of the enterprise for competent personnel. A quota system could be adopted, but, in any case, competence should always be borne in mind.

(viii) Decision-making. The powers of the different organs of the enterprise need to be clearly defined, the board of directors should be well experienced and a procedure of decision-making which avoids unnecessary delays should be established.

(ix) Protection of minority interests. A minor partner should be protected by the inclusion of provisions in the statute of the company ensuring respect for the enterprise's objectives and its regulations or statute and other related matters. A special majority may be established for taking decisions on important matters, thus protecting minority interests. Special provisions may also be accepted regarding voluntary liquidation.

(x) Conflicts of interests. Provisions for settlement of disputes arising from conflict of interests may be included in the statute. Such conflicts may arise from disagreements on policy matters, such as investment of

profits or general objectives of the enterprise.

Joint ventures with developed countries

Multinational shipping enterprises can also be usefully established between developing and developed countries. Such enterprises may be particularly suitable in cases where the investment required is very high, e.g. in containers and LASH systems, as well as for specialized carriers of highly-developed technology, e.g. methane carriers.

Multinational shipping enterprises and co-operation in fields related to maritime transport.

The establishment of a multinational shipping enterprise may lead to, and would also benefit from co-operation in the following areas:

General shipping policy, consultation machinery, concentration of cargoes and the establishment of joint freight booking centres, inland transport, development of ports, ship repairing facilities, training of managers and seagoing personnel, regulations on manning and on minimum standard of competence for seagoing personnel and conditions of employment.

Examples of multinational shipping enterprises are:

(a) The East African National Shipping Line, belonging to Uganda, Kenya, Tanzania and Zambia; (b) The Flota Mercante Grancolombiana belonging to Ecuador and Colombia; and (c) The West Indies Shipping Corporation belonging to a number of countries in the Caribbean Sea.

A recent development is the establishment of the Arabian Maritime Petroleum Transportation Company among the following countries: Abu Dabi, Algeria, Bahrain, Kuwait, Libya, Qatar, Iraq and Saudi Arabia.

In the field of air transport, a relevant example is the Scandinavian Airlines System (SAS) which is a consortium of three national companies established in Denmark, Norway and Sweden.

A FORK TARIFF SYSTEM FOR LINER FREIGHT RATES*

Introduction

In this paper, it is proposed to show how conference rate making could be made more flexible, and how this would lead to economic gain.

To restrict competition between the member lines of a conference, it has commonly been considered necessary for all members to charge identical freight rates. These inherently stable freight rates give short-term benefits, but the lack of competition tends in the longer term to increase costs, and thereby freight rates, through inefficiency and lack of co-ordination. At the other extreme, the operation of liner services in a freely competitive environment would almost certainly lead to irregularity of sailings and volatile freight rates, which are inconvenient and far from conducive to trade.

It seems possible, however, for a useful compromise to be achieved through the establishment of a commodity tariff or classification wherein rates are allowed to fluctuate between carefully defined upper and lower limits. Under such a system, known as a fork tariff, the individual shipowner could respond to changing demand by varying the basic rates set by the conference. Care would be needed in defining the lower limit, lest unintended cut-throat competition should bring unfair advantages to the financially strongest conference members.

For simplicity, the variations could be discrete percentages. Basic rates might be termed "Conference flat", while adjusted rates advertised for a particular sailing might be designated "Conference $\pm x\%$ ".

Advantages of the fork tariff

Requirements of shippers

One of the major stated objectives of conferences is to render services relevant to the requirements of trade and of shippers. The provision of the same liner service to every shipper means, however, that some shippers pay for more service than they require. An opportunity may exist here for differential pricing in respect of different standards of service. This would have the direct result of quantifying demand for different standards in such matters as regularity and frequency. By use of the fork tariff, shipowners would be encouraged to provide services more adequately tailored than hitherto to the requirements of individual shippers or groups of shippers. To some shippers, speed is essential (faster transport can mean more effective use of market opportunities); and those who require higher speeds should be willing to pay for them. Indeed, the introduction of containerization on many of the major trade routes has brought about a growing realization that, for an increasing number of shippers, speed, regularity, frequency and reliability are

more important than cost. Under the present conference arrangements, the demand for services other than "standard" cannot be expressed through the pricing mechanism, and the usual pooling arrangements necessarily reduce any incentives to vary existing standards. Even the provision of something resembling a tramp service might be considered for those cargoes which, because of the continuing growth of trade, are now frequently moving in ship-load quantities.

Specialized ships

Price competition being prescribed under conference agreements, emphasis is placed on quality of service and, in some cases, on competition for the more highly rated traffics. There is no real reason why ships belonging to conference lines should remain stereotypes of the present and be prevented by conference rules from including ships of greater diversity and specialization (even to the extent of specialization in bulk cargoes). The ultimate aim should be to provide the right type of ship for the cargo to be carried. The phasing-out of unsuitable ships could come through the application of wider rate differentials in relation to cost of carriage by the individual carrier. One result would be to avoid conferring on a trade a service costing more than, given a free choice, the trade would be willing to support.

Consolidation of shipments

It is fundamental that, if small shippers of the same basic commodities grouped together to present their goods for shipment collectively rather than individually, both shippers and shipowners would benefit from the rationalization of handling and documentation. The effect of numerous shippers individually forwarding their goods on a small scale is likely to be a tonnage surplus through too many calls for too little traffic; this is a frequent problem with liner services. The fork tariff could be used to provide the necessary incentive by which many small shipments could be consolidated before loading by groups of shippers or marketing boards. This does not imply that the structure of the trade should be radically altered, but that small shippers should combine to ensure that the time-space requirements of their shipments are rationalized. In return, they would be offered lower rates according to the size and regularity of their collective shipments. A scale relating cost savings to shipment size could be deduced quite readily.

Peaks and troughs

Because of the seasonal character of many trades, the aggregate tonnage of ships maintained by all shipping companies in a conference generally exceeds the aggregate that would be necessary for the same amount of trade under free competition. It is in the nature of liner services, however, to provide largely for peak shipments; this causes over-capacity at troughs. The extra cost of

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providing for the peak services must be paid for. By charging uniform rates throughout the year, the present conference system has failed to produce any incentive to shippers to flatten the peaks, especially those caused by fiscal arrangements in certain countries. It is recognized that certain peaks cannot be avoided — the ripening of fruit and the killing of new season's lamb cannot be delayed; but storage and processing could, in favourable circumstances, cause these peaks to be reduced in size. If peak shipments were penalized through higher rates, shippers might be influenced to rationalize their shipments or to eliminate those factors which activate peak demands for shipping space. Thus, the basic freight rate would move by calculated percentages, increasing during peak periods and decreasing at other times.

Ports and blanket rates

Within the sphere of conference activities, a practice which has been widely criticised is the use of "blanket rates", the effect of which is to ensure that the same rate is charged for a number of ports within a convenient geographical range. One of the major factors leading to increased costs of liner services is the increased cost of a ship's time in ports. The usual conference policy of averaging rates to give "blanket coverage" has not helped to increase the efficiency of those ports which are greatly in need of improvement through capital investment. Surcharges are short-term measures and have generally proved ineffective. It is suggested that the fork tariff could be applied in a way that would promote a continuously improving standard of efficiency in ports. The efficiency of each port over a specific period of time could be rated. The efficient port would not then be penalized in favour of the less efficient port, and its trade would be stimulated by the application of reduced freight charges in relation to those of its competitors.

The two main criteria for assessing port efficiency would be (i) port and cargo handling charges and (ii) cost of ship's time in port stemming from delays due to congestion, labour shortage and slow handling of cargo. Some ports might be prone to extremes of weather which might affect the average speed of cargo working. If such ports were penalized through the charging of higher freight rates, they would be more inclined to invest in devices (such as the all-weather meat-loaders in Bluff and Timaru, New Zealand) to offset the effects of inclement weather.

Some shippers are burdened with additional inland transport costs in forwarding goods to a port offering more regular and frequent sailings. Perhaps their local port, with its small and irregular shipments, fails to attract regular calls from liners. The possibility for shipowners to raise freight rates for this class of port could cause sailings to be changed from an "inducement" to a regular basis, with consequent advantage to shippers in the port's immediate hinterland. As traffic levels improved, rates could be reduced, *pari passu*, to realign them with those operative in other conference ports.

Efficiency of shipowners and shippers

The conference system fails to provide for shipowners the incentive to compete and effect economies. At the same time, the vast inertia inherent in the system creates an atmosphere resistant to improvements. Although rate competition cannot exist, limited competition in service, care of cargo, documentation etc. remain. Cargo and cargo/revenue pooling arrangements, however, tend to lessen any advantage accruing from service competition, and therefore reduce the incentive for it.

Competition, especially in the short term, is undoubtedly an effective tool for promoting efficiency. On the other hand, competition often produces wasted capacity; and unregulated competition between different liners on a trade route is likely to produce more surplus capacity than liner services operating within a conference system where sailing schedules are rationalized. Rationalization under conference arrangements may, perhaps, produce too little capacity, so that too much cargo is shut out too frequently.

Under a fork tariff system, the liner services could be rationalized, while, at the same time, shipowners would be able to compete with each other, at least to a limited extent. In this way, the most efficient would be able to profit by their efficiency and perhaps obtain a greater share of the trade. With the "closed" conference, such a radical change does not seem possible. With the "open" conferences, in which rationalization of sailing schedules is not a prominent feature, the introduction of a fork tariff system should enable shipowners to compete in freight rates between the agreed limits. It is envisaged that, initially, the freight rates offered would be identical; but, as one line obtained, through quality, speed or efficiency, a greater share of the trade, it could increase its freight rates, while the less efficient lines would, in order to regain some of the lost traffic, be forced to reduce theirs. An equilibrium position would be reached, and, as the efficiency of the individual lines changed, so gradually would the freight rates which those lines charged. Shippers would, of course, need to be fully aware of the situation and act accordingly. Any line with lower costs than those of its competitors could afford to reduce rates in order to capture a larger percentage of the trade, and this might force others to follow suit. The long-term effect could be that the inefficient or high-cost operators would find that they were operating in conditions where their profit margins were too low, and they would be forced to reconsider the desirability of investing in liner shipping.

Any subsidization of national flag lines of developing countries would be made by the Government of the country concerned, and not at the expense of other member lines.

Shippers can also affect the efficiency and costs of liner operation in the period when cargoes are delivered to the berth prior to shipment. Ideally, the shipowner should have most of the cargo on the wharf or in the shed nearby when the vessel begins to load; otherwise, serious delays can occur. These tend to increase the over-all costs of loading, and shippers who tender their goods for shipment after the advertised closing date should therefore be

penalized. An intelligent use of the fork tariff system is one way in which this could be accomplished without too much difficulty. Where desirable, shippers could be offered incentives under this system to present their goods for shipment on pallets.

Changes in exchange rates

Freight rates are normally quoted in terms of only one currency. Any change in parity between currencies of countries involved in the trade routes, either through nationality of the member lines or through origin or destination of goods, can affect the net freight earnings of the individual members to a different extent. A fork tariff can provide the instrument whereby rates can be equitably adjusted, and with less difficulty, to take currency changes into account.

Promotion of trade

There are obvious benefits in a system of freight rates that can be regulated, not only according to service rendered but also in relation to what the traffic will bear. A policy for setting basic freight rates on the basis of what the traffic can bear, while enabling the rates to float flexibly between upper and lower limits, ensures that any benefits are maximized and any undesirable effects

minimized.

In seeking to promote trade (with developing countries especially in mind), the shipowner has in the fork tariff a margin to ensure that somewhere between the two levels his interest will coincide with that of a shipper seeking promotional freight rates. Promotional freight rates can generate trade which is mutually beneficial to carrier and shipper. The flexibility can help developing countries, since an approach to an individual shipowner is far less complicated than an approach through the conference machinery.

Limitations of the fork tariff

The extent of the constraint on adopting a fork tariff would depend upon the monopoly power of the conference, and especially upon its pooling arrangements.

How effectively a floating rate could be enforced would also depend upon the elasticity of demand for the commodities moving in individual trade routes.

The administrative complexity, and the cost of implementing and updating the increments to be applied to the basic freight rates, could act as a deterrent.

Nevertheless, a fork tariff could be the catalyst to hasten the elimination of inefficient services operating within conferences and to remove some other aspects of conferences which have given rise to a great deal of criticism from shippers.

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TECHNOLOGICAL CHANGE AND THE DEMAND FOR PORT SERVICES*

Introduction

One of the greatest problems to confront an industry is innovation and technological change. These problems are all the more demanding in industries which, in the past, have experienced relatively minor or a slow rate of change and where, as a result, operational practices and, perhaps more important, attitudes have become entrenched and resolute.

Indeed the future success of an industry or component part may largely depend upon the way in which it adapts to meet new conditions and circumstances. In response to technological developments, many of the world's major ports have undergone radical change in the past decade.

Even the casual observer must be impressed by the fundamental changes taking place in the maritime industry; changes which have significantly altered the traditional landscape of many ports and introduced new concepts in cargo handling. These changes have not, however, been restricted to the mere obvious improvements in the port infrastructure and superstructure. Rapid change brings in its wake new and often complex managerial problems in hinterland transportation systems which eventually may become manifest at the port interface.

Thus, in a period of change, it is imperative that port authorities adopt sound planning principles if scarce financial resources are to be employed in the national interest. This lecture briefly discusses the impact of technological change in the maritime industry on ports and develops the salient principles to be adopted in the planning and design of port facilities.

The changing patterns of international trade

The demand for shipping and port capacity is a derived demand resulting from developments in international seaborne trade. Thus any structural changes in trading patterns and or technological change that introduces a degree of rationalisation in shipping services has immediate effects on ports. Thus, while many major trades and shipping services remain committed to specific regions or ports, often as a result of industrial inertia and traditional relationships, an increasing number of trades is exhibiting transient features. Take for instance the introduction of feeder services in the unitized and bulk trades, which has underlined the mobility of cargo movements and introduced strong inter-port competition not only on a national but also a regional basis. If this trend continues and expands to include other trades, then future traffic flows through individual ports, whether they be of primary or secondary status, will inexorably reflect the structural changes taking place in trading and distribution patterns. This implies a weakening in the traditional relationship that certain commodities and/or shipping conferences have with individual ports.

The role of ports in the national and regional economy

A further factor is the significance of ports in the local, regional and national economy of a country. Ports are major nodes in national and international maritime transport and provide a vital link in the transportation chain. The diverse needs of port users — shippers, shipowners, industry, etc., mean that the port is subject to demands for services and facilities from a wide range of trades, each expecting facilities and services to be provided to meet their individual needs. Thus, the port has to respond to this derived demand and in addition must provide the necessary facilities and economic environment that will induce economic and industrial activity. The port can, therefore, act as a catalyst or growth pole in the socio-economic development programme and policies of regional and national government.

The role of ports in the total transportation system

The overall objective in the total transportation system is to minimize transport costs. However, the total transportation system is complex, composed as it is of numerous sub-systems, each with their own objectives and constraints. This conflict of interests is difficult to resolve. For example, by increasing ship size we would expect to obtain reduced freight rates in the maritime link assuming demand was sufficient to transport commodities in these consignment sizes. However, unless the ports can physically accommodate these ships and cargo handling productivity subsequently increased, the economies of scale in the maritime link may be lost through additional time spent in port. Furthermore, if ports cannot accommodate ship sizes which shippers and shipowners consider economic, then there is a distinct possibility that cargo will be transhipped in smaller vessels. This could mean additional handling costs and loss of revenue to the port authority.

Increasing ship size and subsequent consignment sizes will place greater pressure on port storage requirements and the hinterland transportation system. Unless the road, rail or inland waterways are capable of handling the increased throughputs, the storage, inventory and handling costs may negate previous cost savings. It is evident, therefore, that the transportation planner must identify the subsystem capacities and constraints if improvements in the total system are to be obtained. The initial stage will be to determine the benefits of suboptimizing each of the sub-systems.

In this context, it is important to obtain a detailed breakdown of costs in the total transportation system and their sensitivity to change. Port costs vary as a percentage of landed or c.i.f. values depending upon the nature, value and quantity of cargo handled. Thus, major improvements in ports may make minor or major changes in total costs and demand depending upon the elasticity of demand and the proportion that port costs constitute of the total cost. A detailed knowledge of costs also identifies high cost activities and provides guidance on investment

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decisions and long term planning requirements.

Major industrial ports provide a stimulus to international trade and provide a growth centre for development. A number of major ports, including some in this region, and increasing the scale of industrial activity undertaken within the port area. With one of the objectives to minimize transportation costs, many primary industries, particularly those dependent upon the importation of high bulk, low value commodities find significant advantages in locating industry in the port zone. Flour milling, steel production, oil refining and chemical production provide excellent examples. In turn, these primary industries often attract secondary industries which broaden or diversify the industrial base and commodity mix of the port. The development of industrial ports demands deep water close in shore and an adequate supply of suitable land for industrial development. Unfortunately, a number of ports, particularly those built before the second world war, are often located on rivers in densely populated urban areas with little land available for expansion. And inadequate water depths. The emergence of new demands upon ports has witnessed a migration of ports from old river or shallow water location to keep water estuarial locations where the above requirements can be met.

The impact of changing ship design on port requirements

Since the early 1960s, the world has witnessed a prolific growth in the dimensions of ships together with quite radical changes in the range and structural design of vessels. We live in an age of specialization where, for example, the common purpose tramp ship designed to carry a wide range of commodities has been replaced by specialized vessels designed to meet the specific needs of a trade and to take advantage of economies of scale. The salient factors influencing these trends are:—

- (a) The significant increase in international maritime trade.
- (b) The ability to obtain economies of scale and improved efficiency through specialization.
- (c) The development of inter-modal transportation.

The benefits of specialization and economies of scale will not be obtained unless the port authority can provide the required infrastructure and superstructure. In many countries, existing ports have become obsolete as a result of these developments and major dredging commitments have had to be undertaken. In addition, many ports are experiencing increasing port congestion problems as the result of inadequate facilities or poor performance at existing facilities. The problems of technological change go well beyond the physical requirements and include operational and administrative matters.

The growth of international seaborne trade has fluctuated between 4 per cent and 13 per cent over the past decade with a rate of 6 per cent attained in 1972. This represented a total trade of 2,861 million metric tons. Within this total tonnage, individual trades have developed at different rates. The trade in petroleum products has increased on average by 10 per cent per annum over the past decade, while the dry bulk trades have increased by 7 per cent. With the present oil price

surcharge and the subsequent reduction in world demand, the total shipment of oil is expected to stabilize, or possibly contract slightly in the short term.

The major increase in vessel size has taken place in tanker trades. In August 1972, the number of tankers of 15,000 tons grt and above in service was 2,010 with an average deadweight of 50,000 tons. However, the number of tankers of 15,000 tons grt and above on order in August 1973 was 1,349 with an average deadweight of 138,000 tons. Of the number of tankers on order, some 464 vessels were in excess of 200,000 tons deadweight. Vessels of just under 500,000 tons are already in service, while orders have been placed for vessels in the 700,000 tons range and the prospect of a million tons tanker is becoming more of a reality. These developments will depend upon demand factors, the re-opening of the Suez Canal and technical aspects. To put these sizes into perspective, the port authority handling 500,000 ton tankers will require a depth of water in excess of 100 feet and must cater for a length of 1,300 feet and a beam in excess of 200 feet. A series of graphs will be shown to illustrate developments in this trade.

In the dry bulk cargo trades, the trend is similar if not so dramatic. In 1972, there were 3,091 dry bulk carriers of 10,000 tons deadweight and above in service of which only 166 were of 100,000 tons and above. The number on order was 697 with 166 vessels or 24 per cent in excess of 100,000 tons. As the quantity and consign-ment sizes of dry bulk cargoes increases the trend, except in cases where there are intractable physical limitations (e.g. the St. Lawrence Seaway), is for vessels in excess of 100,000 tons to be introduced. This trend is clearly discernable in the major dry bulk trades, but apart from comparatively few OBO vessels in the 175,000 to 225,000 tons range, the upper limit of purpose-built dry bulk vessel appears to be 150,000 tons. A further restriction is imposed on the smaller bulk carriers that wish to transit the Panama Canal; the maximum beam is 106 feet restricting size to approximately 70,000/80,000 tons deadweight.

In the unitized trades, the number of full and part container vessels in service in 1973 was 943 with a total carrying capacity equivalent to 386,379 of 20 ft. containers. This includes newly built and converted tonnage. The growth in lo/lo container ship construction peaked in 1972 with 162 vessels coming into service in that year. In 1973, the figures had declined to 38 vessels as the major investment in the major trades considered suitable for containerization had been undertaken.

The majority of new vessels entering the container trade were of the smaller sizes suitable for coastal, feeder or short sea services. However, at that time the third generation container ships were entering service with capacities in excess of 2,000 boxes and with draughts of 42 feet and a length and beam of approximately 900 and 105 feet respectively.

In addition to major developments in the bulk and container trades, there has been increasing interest in other specialized trades. Developments in the unitized trades include the introduction of deep sea ro/ro vessels (PAD) and the entry into service of the LASH and SEABEE barge systems. In 1971, it was estimated that 18

barge-carrying vessels were in service or under construction and 25 planned. Tug-barge systems are becoming more popular, particularly in areas where the inland waterways are well developed, but to date this system has largely unexploited. Further more, there has been a significant expansion in the range and number of vessels transporting bulk chemicals and liquified gas carriers. Over 500 vessels are now in service and they place additional responsibilities of pollution, environmental protection and risk associated with hazardous cargoes, upon port authorities. Further developments and examples of specialization in the shipping industry are the construction of specialized car carriers and the development of SLURP vessels in the iron ore trade.

These developments in the nature and physical dimensions of ships provide complex planning problems for port authorities. The problem of not only adapting to, but keeping ahead of technological change is made more difficult by the fact that port authorities are not involved in the preliminary planning of trade routes and the design of vessels to undertake the trade. For the shipowner to develop a new design or introduce a new service which demands specialized facilities may take a comparatively short time, often under 3 years depending upon the state of the world's shipyard order books. Industrial port users can erect production or storage facilities in a similar time scale. For a port authority however, faced with the need to design and construct a new port or terminal to handle this trade, it may take 8 to 10 years.

To select a site, undertake physical investigations, purchase the land, obtain the necessary enabling legislation and then undertake the often protracted construction period may take a considerable time from concept to reality. Throughout this time, the nature and size of vessels on the trade may be increasing implying the need to continually review the plans. It is opportune to note that container and some other specialized terminals have taken considerably less time due to the fact that the basic infrastructure was suitable for adaptation to meet the needs of the trade.

The physical requirements are not restricted to the provision of deep water terminal facilities. Deep water channels often dredged miles out to sea have to be provided and protection afforded from the natural elements. The movement of VLCCs is considerably different from small cargo liners and consideration must be given to channel widths, turning circles, etc., since the swept track width of such vessels, particularly under the influence of wind or tide, is very large. Thus in addition to initial capital dredging requirements, a continuous maintenance dredging commitment may be necessary. The introduction of SLURP vessels and the provision of single buoy moorings (SBM) have, however, reduced the investment in port infrastructure. Over 100 SBMs have now been laid and provided they are located in protected waters they offer considerable cost savings.

The corollary to not providing adequate facilities in your ports is that your country may become dependent upon feeder services. This is an already well developed distribution procedure in the unitized and tanker trades but one which politically and strategically may be unacceptable to you.

Effect of operational requirements on ports

The increasing size of cargo consignments emphasizes the need to provide improved cargo handling facilities and storage requirements to improve productivity and reduce the time cargo spends in transit. The changes in cargo handling techniques implies the need for more administrative control not less in the total transportation system. Thus, one now witnesses an extension of the traditional role of port authorities into other activities and, through its pricing and other policies, increased control of operations. The integrated services now being created by shipping lines whereby they undertake forwarding agency, road haulage and stevedoring etc. is another example.

The concept today in operational terms is one of space. The traditional break bulk general cargo berth of the 1940/1950s occupied no more than 2 to 4 acres. Today the modern deep sea container terminal requires 30 acres with possibly a further 10 to 20 acres in reserve to meet future demand. The multipurpose nature of port facilities in which it was possible to load or discharge a number of different commodities at the same berth is being replaced by specialized terminals designed with one trade in mind.

This presents a major problem for the ports of developing countries where the demand for or supply of individual commodities may not justify investment in a specialized terminal. Yet without the right equipment and design, productivity may be well below competitors' levels with resultant increases in unit costs. To ensure that cargo handling and transportation costs are minimized and, to protect against constructing facilities that remain under utilized may require the development of a multipurpose berth with certain special features. The concept of a modern multipurpose berth is the provision of facilities that are capable of handling a number of homogeneous commodities. This will provide a viable throughput which avoids under utilization of assets. Thus, if a terminal could be designed and provided with a range of equipment that, while not necessarily meeting in full the requirements of individual trades, provides a compromise solution with the objective of maximizing the functional requirements, this will alleviate the problems of under utilization while introducing significant improvements in productivity. This then is the economic and operational rationale of the modern multipurpose terminal which may for example be designed to handle containers, packaged timber, steel and cars.

The leasing of terminals to individual or groups of users is a growing feature of the past decade. The need to improve port productivity has been accompanied by the introduction of more automated facilities and expansion of mechanical handling equipment. These developments are not widespread in areas where labour rates are low, but in the USA and western Europe the move to more capital intensive operations is clearly evident. This introduces social problems often associated with the move from labour intensive to capital intensive operations and hence, as a result of technological change, precautions or steps have to be taken to safeguard the future employment opportunities of labour.

Technological developments in the inland transportation system including road, rail, inland waterways, pipelines, etc., also have to be considered by the ports. It is essential to provide compatibility of equipment and procedures if the cargo transfer operation is to be undertaken efficiently.

The principles of port planning

A prerequisite for successful port planning is the preparation of a master plan which contains details of present and future port development. The plan should attempt to identify and satisfy future port requirements but must incorporate a degree of flexibility, particularly for long term projects which will have to be amended in response to technological change and operating experience.

The nature of and detail contained in the master plan and the projected time scale of development will depend upon a number of factors. One of the important considerations is the type and present role of the port. This may be either a:—

- (a) Transit port
- (b) Industrial port
- (c) Multipurpose port.

The development of a master plan will include an appraisal of operational, economic and physical factors and will involve discussions with and the co-operation of local and central government, shipowners, shippers and other national bodies concerned. The development of a port's policy, particularly in developing countries where numerous projects are competing for scarce capital resources, will include detailed investigation of the national physical and economic framework, land availability and industrial location aspects, shipping procedures and the balance between inter and intra sector developments.

The construction of a new port or the extension of existing facilities may be required for a number of reasons, the most recurrent of which are:—

- (a) The discovery of resources destined for export markets.
- (b) The result of economic growth.
- (c) Obsolescence of existing facilities.

Obsolescence is of major concern to port planners who, when developing physical plans and appraising investment decisions, must take into consideration the following common features of port investments:—

- (a) A large proportion of the capital is employed in fixed assets.
- (b) Most facilities provided in ports, particularly those of a static nature, have long physical lives.
- (c) Most investment projects are of a cost reducing as opposed to a revenue earning nature.

The location of new facilities depends upon a number of factors — economic, physical, operational and political. However, before decision is taken to construct new facilities, exhaustive studies should be made to identify future demand. Market research techniques may be employed to study the:—

- (a) Traffic forecasts. An analysis, commodity by

commodity, of existing major traffics and future trends. The identification of potential new trades or traffics expected to appear in the future.

- (b) The impact of technological change in the design and construction of new vessels, new cargo types and the introduction of new cargo handling techniques.
- (c) Expected changes in productivity and developments in inland transportation, distribution and marketing policies.

While certain well tried techniques are used to identify these factors the study automatically incorporates a degree of subjective thinking and an element of crystal ball gazing. Extensive use should be made of central and local government statistics, industry reports, etc., and information published by national and international agencies. The time scale for forecasting and planning of port developments will vary but the three types of forecasting that normally apply are:—

- (a) Short term forecasting.

In this type of forecasting, the port authority is primarily concerned with day to day requirements of balancing supply and demand. The provision of additional facilities and capacity in port is usually provided in large incremental steps so that the nature of short term forecasting is restricted to seasonal trend analysis, minor improvement schemes, and the deployment of resources in the most efficient manner.

- (b) Medium term forecasting.

Medium term forecasting normally involves planning in a time scale of from 1-10 years. The major objective is to determine or highlight potential developments and trends and provide a comparative analysis of strengths and weaknesses in particular trades.

- (c) Long term forecasting.

This is the most intractable problem since it involves the forecasting of technological change. Scenario and futuristic techniques are currently in vogue for this purpose.

In view of the nature and type of planning, decisions taken in the ports, the framework of the master plan and the design of facilities should incorporate the following salient principles:—

1. *Flexibility and versatility*

The ability to adapt facilities to meet the changing needs of maritime transport. Port facilities have long physical lives which make it imperative that they can be quickly adapted to meet the demands of new traffics or transport requirements.

2. *Integration*

Greater emphasis is now placed on the port's function as an interface and the concept of through transport. To improve the cargo transfer operation, greater consideration is being given to designs which facilitate improved working methods and contribute to compatibility between handling equipment and the different modes of transport.

3. *Space*

Modern port development incorporates the concept of space. This is made possible by the move from labour to capital intensive operations and the introduction of specialized mobile plant. Adequate reserved land areas have to be provided for future expansion if congestion and urban strangulation are to be avoided.

In the interests of economy and efficiency, the objective should be to minimize capital expenditure, utilize land effectively by zoning operations and, if possible, making use of reclaimed areas and adopting commercial land management.

Design criteria

Design criteria can conveniently be classified under three interdependent headings:—

1. Physical
2. Functional
3. Financial.

1. *Physical criteria*

- (a) Oceanographical factors:— Before detailed planning of port facilities is undertaken, exhaustive site surveys are conducted and a thorough analysis of existing physical data carried out.

Oceanographical studies including the observation of wave action, swell, tidal phenomena and currents are conducted to calculate the forces on marine structures. Detailed studies on siltation patterns, the transport of suspended material and the affects of beach erosion are undertaken. Littoral drift, the existence of ebb and flow channels and, in the case of river ports, helical flow are investigated to eliminate or reduce dredging requirements.

- (b) Meteorological factors:— The amplitude and speed of waves in the open sea are dependent upon wind speed, the time during which the wind has been blowing, and the fetch, the unobstructed distance of windward over the sea. Since wave energy is an important factor in determining the type of construction and the degree of protection provided, a detailed analysis of meteorological data is necessary.
- (c) Site surveys:— Detailed topographical and hydrological surveys and site subsoil investigations are necessary to determine the most suitable form of construction. Hydraulic model

tests are often conducted to investigate the suitability of designs and the likely affects on the regime of the harbour or estuary.

2. *Functional criteria*

The location and layout of facilities will depend upon the type of vessels, the nature of the traffic and the working methods adopted. Consideration must be given to approach channels to avoid sharp bends, and to provide safe access to the berth.

Advantage should be taken of natural deep water and sheltered locations and where possible quays should be designed to avoid the reliance on tugs. The type of quay construction will depend upon the results of the subsoil investigations, the mooring forces and vessel impact expected, and the quay loadings. These in turn depend upon the cargo handled, the equipment used and the proportion of cargo moving by road or rail.

3. *Financial criteria*

Financial criteria involves the identification of cost savings and new sources of revenue resulting from the investment and includes:—

- (a) Reduced freight rates as a direct benefit from the use of larger vessels.
- (b) The elimination of congestion avoiding the imposition of freight surcharges.
- (c) Reduced operating costs as a result of improved working methods.
- (d) Additional revenue from the increased throughput that new facilities may attract.

Financial criteria includes the appraisal of alternative designs and methods of construction and identification of additional benefits arising from the prudent timing of investment.

Conclusion

Rapid technological change presents major problems to the port planner. Developments in trading patterns, industrial location, transportation and shipping practices and procedures may have significant and immediate effect on the design and operation of facilities. It is imperative therefore that government departments responsible for the planning function calls for a multi-disciplinary team approach and relies heavily on the participation and co-operation of shipowners, shippers, industrialists and government agencies. Without a comprehensive and well developed national policy, ports will be vulnerable to technological change and to the ensuring problems that this brings.

FINANCIAL POLICIES AND PRESENT CHARGING PRACTICES OF PORT AUTHORITIES*

The often complex, cumbersome and archaic structure of port tariff schedules supports the need for management to continually review their charging policy and objectives. In the review of port costs and charging practices, particularly if the emphasis is to be placed on rationalizing and updating the tariff, management should ensure that a logical and practical format with sound economic and financial criteria is adopted.

In the study of port costs and pricing policies, two important areas emerge. The first is related to the port authorities' financial and pricing objectives and to the policies and general framework within the tariff is to be developed. The second concerns the identification of costs and a methodology to accomplish this. Hence, the first lecture on this subject will briefly discuss the financial objectives of ports, examine the functions and objectives of port pricing and review present charging practices. The second lecture will concentrate on the nature of costs and discuss the application of sound management costing systems to the port industry.

Financial objectives

It is essential that port authorities clearly identify and define their financial objectives before preparing the port tariff. The pricing policy is the mechanism by which the port recovers sufficient revenue to meet financial objectives and hence the two factors are directly related. The application of common financial policies and objectives is not, however, an easy matter. Setting financial targets for an individual port may present no problem, but setting these for an entire industry, particularly where a wide range of forms of ownership and administration are involved, presents immense problems. In countries where there is a diversity of forms of ownership and where, as a result, port authorities may be responsible and answerable to different bodies, the problem may appear intractable. However, in a large number of developing countries, the ports are either directly owned or to some degree controlled by the State and this provides an opportunity for the Government to establish common national financial objectives.

The benefits of establishing common financial objectives are:-

- (a) It provides a goal or target for management to attain. This also provides a means of determining how effective the management and policy of the port is.
- (b) Provides a means of comparing the performance of different ports.
- (c) That pricing policies will be based on similar criteria.
- (d) Ensure that scarce resources are employed in the best possible prospects from a national point of view.

The financial objectives established by the Government or individual port may be:-

- (a) To maximize profits.
- (b) To obtain a commercial or nominal rate of return on capital invested in the port. Alternatively this may be expressed as a cash flow requirement.
- (c) To cover all capital and operating costs but to be non-profit making.
- (d) A policy to provide some degree of direct subsidization for capital and operating expenditure.

The objective of profit maximization is more likely to be followed by port authorities in private ownership who have to provide comparable returns on shareholders' investment and face the risk of takeovers. Very few ports in the world are in fact equity-financed and many of them are operated by companies as an integral part of their production and transportation operations.

Many ports in both developed and developing countries, particularly those that are state-nationalized, have adopted a policy of requiring port authorities to show a commercial rate of return on capital employed. This rate of return is often established for all nationalized industries, including the transportation sector, and is often related to the rate of return obtained in the private sector.

The Rochdale Committee, reporting in 1962 on the state of United Kingdom ports, put forward financial recommendations which provide an example of the non-profit making port. A great number of developing countries have in fact adopted similar policies whereby the authority is expected to cover:-

- working expenses
- interest on loans
- depreciation of assets on a replacement cost basis
- taxation
- a margin for reserves to meet contingencies and help finance minor improvements.

Many Governments adopt the objective of subsidizing port authorities. The notable examples of such a policy are continental European and American ports. Many ports, irrespective of ownership or financial objectives receive indirect subsidies in a number of ways. For example, the provision of a new railway system connecting a port to a wider hinterland or improvements in the road transportation network may improve efficiency and generate more traffic and provide additional revenue and benefits to individual or groups of ports. Direct subsidization may be provided on capital and/or revenue account to cover almost all facilities and services provided by port authorities. The case for subsidization of port activities, particularly in the municipal and state owned ports, is based on a policy of considering ports as public utilities. Thus, ports are viewed as a strategic national requirement which should not be required to show a return on capital. This policy places ports in the position

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of a catalyst that will stimulate international and national maritime trade, develop related regional development policies, support industrialization and the development of MIDAS schemes and generally form a plank in government development policy.

Subsidization may be provided in a number of ways. Some examples of these are:-

- (a) Direct state investment in port infrastructure or superstructure.
- (b) Interest-free loans or loans provided at nominal interest rates and easy repayment conditions.
- (c) Maintenance of maritime infrastructure at state expense.
- (d) Operational deficits covered by state finance.

This far from exhaustive list will illustrate the nature of direct state subsidization and leads to discussion of the national planning of port investment. In adopting a national plan, Governments aim to control investment to ensure that scarce capital resources are employed in the most effective manner. Further objectives are to avoid destructive competition, overcapacity and underutilization of port facilities and to ensure compatibility between the needs of and demand for facilities in each mode of the transport sector. This move to national planning has resulted in many cases from a lack of confidence and interest by financial institutions in port authorities, with the result that the majority of new investment has been financed by the Government or loans provided by international agencies. This brief description of some of the characteristics of port financial objectives will be further extended when alternative pricing strategies are discussed.

The function of port pricing

Port authorities are principally concerned with the provision and efficient management of a wide range of facilities and services. However, while the nature of the services and the administrative structure within which they are provided vary from port to port, the pricing structure has three common elements. These are:-

- (a) The flow of costs;
- (b) The flow of benefits;
- (c) The flow of revenue.

The techniques and practices of ascertaining the amount of expenditure incurred or attributable to a particular facility or service introduces the concept of cost. The economist concerns himself with the economic or opportunity cost of resources utilized which is often the national and not the actual monetary cost involved. This is defined as the maximum amount which could be obtained at any point of time if assets or resources were to be sold, hired or put to the most valuable alternative use which would be practicable. Clearly, many of the assets or resources employed in ports have a limited or no alternative use and hence no economic cost. In practice, however, the port authority has to meet costs associated with these facilities and services and this must be provided from the cash flow within the port. In this context, and from a national point of view, the study of port user costs should take the broader view and consider, in addition to

port charges, the following relevant items:-

- (a) Hinterland and international transport costs;
- (b) Stevedoring and handling costs not included in port charges;
- (c) Storage and inventory costs;
- (d) Insurance and agency costs;
- (e) Congestion, idle and waiting time associated with the turn-round time of vessels.

The flow of benefits to port users also needs clarification. For the shipper or cargo-owner, this will be reflected in the 'value added' resulting from his ability to transport goods from production to point of sale. For the shipowner, this is the proportion of the value added he provides in the transportation link and retains through his freight rates. This principle obviously applies to other parties involved in the transportation and distribution chain. However, the benefits to other port users resulting, for example, from investment in the provision of new facilities or improved port infrastructure are more difficult to ascertain.

The flow of revenue to the port authority is that proportion of the benefits to port users retained by means of the tariff schedule. There are obvious limits to the amount of revenue that the port authority can obtain before cargo and trade are diverted to other ports or modes of transport.

Constraints on port pricing

In practice, the port authority's ability to exercise control on the level and structure of port charges has certain constraints. These can be briefly summarized as:-

- (a) Economic constraints:- the port authority will endeavour to at least recover the variable or escapable costs associated with a particular operation and will not be able to recover more than the corresponding benefit derived.
- (b) Institutional and legal constraints:- This includes the influence of government policy on the control of transportation investment and pricing levels. Also, the local and national statutory controls on the level and nature of port tariffs and the government policy on capital and revenue subsidies, discrimination of port users or services and the control exercised by the port authority and private operators in the port.
- (c) Financial constraints:- To ensure, subject to the port authorities' financial objectives, that the flow of revenue covers the flow of costs.
- (d) Competitive constraints:- In the absence of a monopolistic or oligopolistic situation, the level of port charges will be influenced by the competition existing between ports and alternative modes of transport.
- (e) Operational/capacity constraints:- The volume and mix of commodities moving through the port and the physical and operating capacity of facilities to handle the traffic will influence the level of charges.

Possible objectives of port tariffs

In formulating the policies and developing the tariff, the port authority should endeavour to incorporate the following major objectives:-

- (a) To recover the accounting costs in full, based on a sound costing system.
- (b) To promote the most efficient use by port users of the facilities and services provided.
- (c) To provide guidance on the investment policy of the port by determining the effective demand for existing and new facilities.
- (d) To endeavour to retain the benefits resulting from investment within the country.

Further objectives may be:-

- (e) To recover sufficient revenue from users to meet the financial objectives of the port authority. This may include the objective of setting aside resources to be used on projects of an expansionary nature.
- (f) From a national point of view, to minimize total transportation costs. In practice, this is difficult to obtain since the numerous parties involved in the transportation chain may have different administrative status and financial objectives.
- (g) To avoid the indiscriminate subsidy of one port user by another or discrimination against specific trades.
- (h) To provide an incentive to port users to improve their facilities and services.
- (i) From a marketing point of view, to attract the sector of the market for which the port facilities are designed or best suited, or alternatively to encourage a diversification strategy.
- (j) To ensure that the tariff is both practical and simple.

Definition of port charges

The general term "port charges" covers all charges included in the tariff and can be subdivided into:-

Port dues: the charge applied either on the ship or cargo (or both) for the general use of the port without any service being specified. This is normally calculated on the basis of the volume or weight of cargo or the GRT or NRT of the vessel.

Specific port charges: are charges applied for the performance of a specific port service.

Who pays port charges

Time charters:- normally the charterer pays for all port charges and excludes them from the freight.

Voyage charters:- in general, all port dues and other charges related to the vessel, whatever the basis of their calculation, are paid for by the owner and included in the freight rates. All dues and charges on the cargo, not per-

taining to that part of loading and discharging operations which are for the vessel's account under the charter terms, are generally paid for by the charterer.

Liner shipping: normally port dues and other charges relating to the vessel reaching, lying at and leaving the berth, as well as the tariffs for loading and discharging operations, are for the account of the shipowner and included in the freight rate. Charges for landing, storing and delivering cargo are normally borne by the cargo-owner. However, this practice varies with conferences and from port to port.

Types of port charges

It is extremely difficult to generalize in terms of the structure and nomenclature adopted in port tariffs. Attention was drawn earlier to the wide range of facilities and services provided within a port by either the port authority or private operators. While the range and nature of services provided by port authorities are basically similar, the administrative status will determine by whom and how these facilities and services will be provided. This will obviously influence the structure of the tariff. However, the following incorporates the salient features of a port tariff:-

Pilotage

Normally calculated on the basis of GRT or NRT, but, in some cases, on length and/or draught. The nature of the pilotage operation, i.e. whether it is undertaken in coastal waters or enclosed docks and the length of pilotage and other criteria influencing the charging practice.

Towage

This is usually based either on the characteristic of the ship or the tugs performing the operation. In some cases, it is a fixed rate irrespective of the time the operation takes, although the more common practice is to charge a hire rate per hour.

Conservancy dues

In some ports, this is subdivided into a series of individual charges related to the facilities and services requested by the shipowner. However, the more common practice is to make one charge, excluding pilotage and towage, to recover the costs incurred in providing the facilities and services necessary to ensure the safe navigation of vessels within the area under the port authority's jurisdiction. In some cases; it also includes the charge for berthing the ship and dock dues for a specific period of time.

The conservancy due should endeavour to recover the costs of capital and maintenance dredging, the provision of breakwaters, training walls, navigational aids and harbour surveillance facilities. It should also recover the capital and revenue costs of the other facilities and services provided by the marine or harbour master's departments.

Consideration should be given to the following points:-

- (a) Whether this charge should be related to the ship or the cargo carried and the effects of either policy;
- (b) To determine the basis for this charge. Whether it should be related to the vessel's length, draught, GRT or NRT or some other parameter. To determine the effect on the level of charges of adopting alternative parameters;
- (c) To determine whether the vessel's characteristics or nature of the trade, e.g. short sea, coastal trades, warrant special consideration;
- (d) Whether the tariff should include a scale of charges based on the size of vessel or whether a range of charges based on the previous port of call or destination of vessels is justified;
- (e) To consider, particularly in the event of major capital or maintenance dredging programmes, an equitable method of distributing these costs amongst port users;
- (f) Whether concessions should be available for frequent visitors.

Dock or berthing dues

This charge, which is normally a ship related charge, is made to recover the costs associated with the berthing of vessels, whether in enclosed docks or not, and for the use of a berth for a stated period of time. This charge often provides many difficult but not intractable problems since many of the facilities provided at the berth are for the benefit of the shipowner and other port users. In practice, a proportion of the general costs of providing the quay facilities are allocated to the wharfage due and recovered from the shipper, while the remainder is recovered from the shipowner in the dock dues. This problem will be more fully discussed in the second lecture on this subject. The costs recovered by dock dues include the capital and revenue expenditure on the provision, maintenance and operation of locks, maintenance of dredged depths alongside and in the dock basin, fendering, provision of quays and facilities provided on the quay apron.

In determining the level and structure of this charge, consideration should be given to the following points:-

- (a) A clear definition of the facilities and services the cost of which will be recovered through dock dues and an equitable allocation of costs between users of these facilities;
- (b) Determination of the basis for calculating dock dues. This may include length, GRT and NRT, a time factor or the amount of cargo handled;
- (c) The conclusion of special agreements at leased or specialized terminals;
- (d) Whether this charge should be incorporated in the conservancy due which could be based on a two-part tariff to include characteristics of the vessel and length of stay in port;
- (e) An analysis of the sensitivity and impact of the above factors on the level and structure of the tariff.

Wharfage dues

This is a charge, normally related to the cargo, made by port authorities to recover the costs associated with the provision of the basic infrastructure and superstructure of the port to facilitate the movement of cargo from the ship side to the hinterland and vice versa. It includes the capital and revenue costs of providing roads, railways, quays, parking areas, transit shed facilities, police surveillance, etc.

In determining the level and structure of this charge, the following factors should be considered:-

- (a) The adoption of a standard procedure for recovering these charges whether the cargo-handling operations are undertaken by the port authority or private stevedoring companies;
- (b) The basis for calculating the wharfage due, i.e. whether it should be based on the volume or weight of the cargo or based on commodity classification incorporating the characteristics of the cargo.

Storage and warehousing charges

This is the charge made by port authorities to recover the capital and operating costs of providing storage facilities outside the normal free-storage period. This includes transit sheds or warehouses, equipment, power and operating expenses including overheads. The following charging practices are commonly used:-

- (a) A tariff based on the area occupied and the time goods are left in storage. Long-term storage requirements are normally subject to a special contractual rate;
- (b) A differential tariff based on the characteristics of the goods.

Stevedoring costs and charging practices

Ideally, stevedoring costs should be directly related to the costs involved in handling commodities across the quay. In practice, costs may be defined in a number of ways, e.g. marginal, or average costs. The marginal cost would be the cost of handling an additional ton of cargo across the quay and, in most operations, would be lower than the average cost. However, in stevedoring operations where fixed costs may be negligible, the marginal and average costs may be identical. A system of charges based on marginal cost has the advantage that it will lead to maximum utilization of facilities but may not achieve company objectives. If the company is to remain viable, it is preferable to base the charging structure on average costs which are clearly more easily identifiable than marginal costs but not as economically or socially attractive.

In a viable concern, it is important that revenue should cover expenditure in the operation and maintenance of the various facilities provided. However, provision must be made, particularly in such a capital-intensive industry, for depreciation, preferably on a replacement cost basis, and interest charges on borrowed capital. To

this end it is essential that the tariff structure of the company should be closely related to cost. Stevedoring companies in most ports are characterized by the high level of variable costs, e.g. labour, and the comparatively low level of fixed costs, i.e. mobile plant, buildings etc. This is because in many ports the expensive static facilities, e.g. quays, transit sheds and often the mobile plant (e.g. dockside cranes), are provided by the port authority.

In the preparation of tariff structures or the negotiation of contract rates, three principles should be borne in mind:-

1. The charging policy adopted should meet the financial objectives of the company.
2. The rate should offer an incentive to both stevedore and shipowner to improve efficiency and productivity.
3. The charging structure should not discriminate between customers.

This lecture will discuss the merits and disadvantages of four methods of charging for cargo-handling operations currently employed by stevedoring companies.

Commodity rates

This is the most common form of charging practice adopted in ports. A tonnage rate calculated for different commodities is published in the company tariff or negotiated independently with the shipowner. In practice, goods are grouped in commodity classifications with the rate, possibly with minor amendments, applying to a class of goods. This has in the past resulted in some complex tariff structures, but a degree of rationalization is evident with these being replaced by more compact and simplified systems.

The stevedore is paid a fixed amount per ton for the commodity discharged or loaded. Rates are adjusted to meet increased costs, particularly as a result of increased labour wages or the purchase of mechanical handling equipment. Overtime work and non-productive operations, e.g. rigging ships' gear, opening hatches, waiting time, are excluded and invoiced separately. In practice, the commodity or tonnage rate does not differ significantly from the cost plus method because some companies continue to make an additional charge for overhead costs.

The commodity rate method of charging suffers from the following defects:-

1. Net profit is a percentage of direct costs, hence any move by the stevedore to reduce direct costs either by investment in equipment or the introduction of improved methods of working results in reduced profits.
2. It is very difficult to keep an accurate account of non-productive operations. Since these are invoiced separately and may amount to a considerable sum, this often leads to conflict between shipowner and stevedore.
3. Without a degree of rationalization and continual review, the tariff may be complex and difficult to administer.
4. The uncertainties of international trade often mean that the shipowner cannot offer mi-

nimum tonnages or guarantee a commodity mix ratio. In practice, stevedores appear to be disillusioned with the long-term contract based on this system.

5. This system often means that some commodities bear an unjust proportion of costs.

Cost plus method

This method is widely used, particularly in the tramp shipping trades. In this method, the shipowner pays the variable costs attributable to the handling of his cargo plus a percentage of this figure to cover overheads and to provide an element of profit. This is really an open-ended contract. In many ports, the practice is to relate the percentage overhead cost to the gross labour wages account — this can then be easily verified by the shipowner.

This method suffers from the following disadvantages:-

1. The shipowner or shipper is unable to calculate his final costs in advance.
2. It offers no incentive to the stevedore to improve working methods and hence productivity.
3. It may lead to inefficient deployment of labour resources.

Sliding scales

In a recent conference entitled "Stevedoring Contracts and Liner Trades" organized by ICHCA and held in Norway, Mr. C. Hugo discussed the merits of the sliding scale method as a basis for stevedoring contracts. This system appears to have distinct advantages over the above methods and goes some way to satisfying the criticisms levelled at the commodity rate or cost plus methods.

This method is linked to output and productivity. It requires comprehensive knowledge of the stevedore's costs, particularly his labour costs, to arrive at a handling rate. With this cost information, both variable and overhead costs included, a rate per ton for specific commodities or ship loads is negotiated with the stevedore. A productivity agreement is included because, as throughput measured in tons gang hour or tons per shift increase, the rate should fall. Any improvement in productivity which results in lower costs will yield a bonus or increase in net profits. This is divided between the shipowner and stevedore in some predetermined manner, thus offering an incentive and increased profits or reduced costs to both parties. At predetermined intervals, the contract is reviewed in the light of past experience and cost information and the rates revised as a result of this information. Non-productive activities may be included or excluded in the contract, depending upon the reliability of the data and the scale of these activities in the past.

This system has certain major advantages:-

1. The shipowner can calculate his costs to within reasonable limits in advance.
2. It provides an incentive to the shipowner and stevedore. If productivity rises, costs per ton will fall and profits increase, while, if productivity

falls, costs will increase and reduced profits or losses will be experienced.

3. It reduces the possibility of conflict between shipowner and stevedore.

However, it places certain obligations on the stevedore:-

1. The need to accurately identify costs and allocate them in an equitable manner.
2. The need to know the cubic capacity and deadweight tonnage of all cargo handled on which to base the scale.
3. The need for mutual trust between the principal parties.

Consolidated rates

Consolidated cargo-handling rates must be based on accurate commodity costing otherwise the long-term viability of the company will be in doubt. These rates are beneficial to shipowner, shipper and consignee for they have the attractive advantage of being able to quote delivered prices to potential customers.

Consolidated rates may be calculated for a number of activities. It is quite common to find a rate for 'Discharging', 'Receiving', 'Shipping' and 'Loading' in force in a port at one time. The stevedore guarantees a price for each of these activities.

Discharging

The operation of moving cargo from the ship's hold to the quay or to consignee's transport at the ship's side.

Receiving

The operation of handling goods from the ship's side through the transit shed and subsequently to consignee's transport. It does not cover storage costs in the transit shed.

Shipping

The operation of receiving goods from consignor's transport and storing in the transit shed awaiting loading.

Loading

The movement of cargo from the ship's side to final stowage on board. The annex shows a typical breakdown of a discharging and receiving rate.

Column 1

The performance indices on which costs have been based. This may be the tons/gang hour or, as in this case,

the tons per gang shifts.

Column 2

Lists the commodities for which rates have been developed.

Column 3

Details the number of men including the hatchmen employed in the ships gang in agreement with negotiated settlements.

Column 4

Lists the rate per gang for the discharge of one ton of each commodity.

Column 5

Details additional awards, if necessary, to cover freezer cargoes, difficult stowage etc.

Column 6

Covers contingency payments for such items as stevedores' damage, special clothing.

Column 8

Represents a charge of X% of the total appearing in column 7. This covers administration charges and provides an element of profit on capital invested.

Column 10

The cost of tallying cargo is borne in equal proportions by the shipowner and receiver. This column indicates the cost per ton for shipowner's account.

Column 11

Additional contingency charges for claims by dockworkers.

Column 13

Represents a levy or surcharge to cover additional payments, such as idle time, make-up payments under registration or decasualized employment scheme.

Column 15

Lists the crantage rate for discharge of one ton.

Column 16

This gives the total charge per ton to the shipowner. This rate applies to normal working time only. If the shipowner requires additional services to these appearing on the schedule, a separate charge is made.

Consolidated rates are fixed; if the cost to stevedore exceeds this figure then he loses money. It is imperative therefore that he identifies his costs attributable to a particular ship or commodity.

ANNEX
DISCHARGING
(in US dollars)

Tonnage basis	Commodity	Number of men per gang	Rate per ton	Gold Money etc.	Contingency	Total labour cost	Admin. profit	Total	Ship's proportion of tally	Add contingency	Incl. charge to ship	Surcharge	Total	Cranage	Total
60	Apples	7	1.3	0.2	0.3	1.8	1.0	2.8	1.0	0.2	4.0	2.0	6.0	1.5	7.5
100	Timber	9	3.5		1.0	4.5	2.2	6.7	1.0	—	7.7	2.0	9.7	1.5	11.2

RECEIVING
(in US dollars)

Tonnage basis	Commodity	Number of men per gang	Rate per ton	Contingency	Total cost	Admin. profit	Total	Proportion of tally	Add contingency	Inc. charge to trader	Surcharge	Total	Wharfage	Total
60	Apples	6	1.8	0.4	2.2	1.3	3.5	1.0	—	4.5	2.2	6.7	1.8	8.5
100	Timber	2	0.9	0.1	1.0	0.6	1.6	—	—	1.6	0.7	2.3	3.0	5.3

CARGO UNITIZATION AND ITS IMPACT ON PORTS IN DEVELOPING COUNTRIES*

The maritime transport industry has experienced unprecedented developments in the past decade. Perhaps the most significant development is the introduction of unitization and the fundamental changes this has introduced in cargo-handling methods and the design of terminal facilities. While these developments took place initially in the United States and western Europe, the traditional cargo-handling methods are now rapidly being replaced by more sophisticated systems in developing countries. Many ports in the Far East now handle container and barge carrying ships, and the indications are that this traffic will expand in the future, particularly in the coastal and short-sea services.

The running down of conventional break-bulk general cargo handling practices and the growth in unitized trades presents new problems to port and shipping managers. The port manager has to determine future land requirements, provide advice on terminal design and equipment requirements and introduce new working practices in a highly competitive and capital-intensive industry. This lecture briefly discusses the economics of unitization, identifying possible cargo-handling cost savings compared with break-bulk systems and examines the characteristics and port requirements of the numerous unitized systems.

The major objectives of unitization

On reflection, it appears incredible that conventional break-bulk shipping practices should have persisted into the 1960s on the scale experienced. General cargo vessels often spent as much as 60 per cent of their time in port where cargo-handling performance was poor and where rationalization in the number of ports of call offered distinct advantages. The economic justification for critically examining these procedures became more apparent in the early 1960s when, in addition to low utilization of shipping capacity and poor port performance, shipping companies experienced steeply rising costs and reduced company profits. Initially, improvements were made in the design and equipment of conventional ships, although greater interest and emphasis was being placed on the merits and disadvantages of alternative unitization systems. The major need for and objectives of unitization can be briefly summarized as:-

- (a) The improved utilization of shipping capacity and the resultant benefits from economies of scale.
- (b) Improved cargo-handling performance in ports, resulting in lower unit costs.
- (c) A reduction in labour costs, particularly in high-wage countries, with the move from a labour-intensive to a capital-intensive operation. Subsequent steep rises in capital costs have to some extent negated this argument.
- (d) The introduction of a standardized and inte-

grated transport system encouraged intermodal transportation and the concept of a through transport service.

- (e) Ancillary advantages, such as reductions in insurance premiums, packing costs and important indirect savings through reduced transit time and lower inventory levels. Other non-cost advantages include greater reliability, reduced damage, pilferage and cargo deterioration.

While there is general agreement on the advantages of unitization and the objective of providing the most efficient and reliable service to shippers at the least cost, shipowners and transport operators have adopted different systems. Each operator will of course endeavour to introduce the system he considers most suitable for the nature and volume of trade he is engaged in. Hence, today the generic term "unitization" includes minor but relatively significant improvements in conventional break-bulk trades, e.g. pre-slinging, and more sophisticated systems such as containerization, palletization and barge-carrying vessels. The diverse nature and complexity of these systems implies that the results of economic comparison studies is inconclusive. It is extremely difficult to compare the efficiency and performance of alternative systems. The adoption of freight rate levels as the criteria for comparison is unsatisfactory since accurate data are difficult to obtain and is compounded, particularly in highly competitive trades, by the provision of discounts and the sensitivity of costs to cargo volumes and commodity mixes. Furthermore, the practice of container consortia to offer an inclusive charge based on a door to door operation disguises the costs incurred in each subsystem of the total transportation chain. Company profitability is not a wholly satisfactory criterion, although the evidence suggests that profitability has, in many cases, been reduced in recent years. Indications are, however, that while, in general, freight rates have not been reduced with the introduction of unitization, they have increased at a slower rate than would have been the case with conventional techniques.

Review of more recent economic comparison studies

Despite the complexity and constraints discussed above, increasing interest has been shown in comparative studies with the objective of determining the cost structure and advantages of alternative unitization systems. The Economist Intelligence Unit undertook such a study in 1973 to compare the economics of containerization, palletization or lash. The study examined the maritime link between developed and developing countries and concluded that containerization, particularly in the case where vessels with a capacity of 2,000 20' units are employed, is more economical than the other systems studied. The lash system is however more competitive over medium distances (up to 8,000 nautical miles round voyage) than the large container vessels and offers lower costs than the smaller container vessels over the full

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range of round voyage distances. The report concluded that palletization offers cost savings over conventional shipping services but was less economic when compared with containerization and lash.

The study also analysed the alternative systems based on the criteria of maritime costs and port handling costs. Containerization again proved to be the most economic choice of system. In considering the economics of feeder services, the study concluded that over short distances it was more economic to divert the large container vessels than to employ feeder services. This decision will largely depend upon the level of handling costs at the transshipment port and the number of boxes to be loaded/discharged at the way port.

The UNCTAD study "Unitization of cargo" published in 1970, but more recently updated by the secretariat, provides a more comprehensive review of unitization costs as they affect ports. The UNCTAD study concludes, in both the developing and the developed country cases, that barge-carrying vessels offered the lowest port cost per ton on a door-to-door basis. Containerization offered cost savings when compared with palletization and both proved to be more economical than conventional break-bulk shipments. The results of this analysis were obviously sensitive to the number of units moving on a door-to-door basis as opposed to a quay-to-quay basis. In the case where all boxes moved on a quay-to-quay basis, palletization offered marginal cost savings over containerization and barge-carrying vessels which were comparable. This study also emphasized the sensitivity of port costs to the berth throughput levels and the impact of unitization on labour requirements.

The Economist Intelligence Unit also prepared two further studies for the Unit Load Council in which shipping costs from shipper to consignee were considered. The first of these studies, published in July 1973, compared the economics of transporting cargo in break bulk, shipper-packed units and containers. The results of this hypothetical study indicated the distinct cost advantage of shipper-packed units when compared with containerization and conventional techniques. This was followed in May 1974 by a specific study of the trade between Liverpool in the United Kingdom and Lagos in Nigeria. This study was very comprehensive in that it included inland transport costs, cargo-handling and storage costs and ancillary factors, such as packaging and labelling. The results of this study supported the conclusions reached in the hypothetical study.

In selecting these particular studies for discussion, it is not my intention to influence your decision on the choice of unitization systems. While those of you representing port authorities have little influence in this choice, the shipping executives have the major responsibility for the decision. Furthermore, the two major studies discussed above are general studies and the conclusions must be interpreted as such. My objective therefore is to emphasize the need for detailed specific studies to be undertaken of shipping or trading patterns before reaching a decision. The results of these and similar studies do not always support each other. This

apparent contradiction does not necessarily result from the methodology or techniques employed but from the intended emphasis of the study and the resultant assumptions and cost data used. The results of the study can be affected by these assumptions and the specific or general trades investigated. You should be well qualified to adopt realistic and practical assumptions based on your specific country's trading patterns and needs. I would encourage you, therefore, to study these reports and consider not only the conclusions but the methodology adopted and, in particular, sensitivity of costs to changes in the major parameters.

Cargo handling cost savings in unitization

As I have advocated in the previous section, a prerequisite for the economic comparison of alternative unitized systems is a comprehensive and detailed investigation of all costs, both direct and indirect. However, cargo-handling costs together with shipping costs provide the major areas for cost savings and improved efficiency. Most of the cargo moving through the ports of developing countries is still largely handled in loose general cargo form. As a result, cargo is handled numerous times in the total transportation chain from shipper to consignee, adding to the cost of imports and exports. Furthermore, this procedure reduces the capacity of facilities and leads to a less effective deployment of resources. The major advantage of unitization is a reduction in the number of times individual consignments are handled by consolidating cargo into standardized units. While this will provide a more effective and productive cargo transfer process, it often requires investment in specialized equipment and demands more highly qualified personnel.

The major cargo-handling cost savings of unitization when compared with break-bulk shipments can be briefly summarized as:-

- (a) Reduced packaging and labelling costs since cargo is afforded greater protection in containers or shipper-packed units.
- (b) Improved cargo-handling performance and reduced costs at shippers' and consignees' premises. Additional advantages include improved utilization of storage facilities and a more rational choice of equipment.
- (c) Improved cargo-handling procedures in the port. This improves productivity and reduces delays and hence demurrage charges on road and rail vehicles.
- (d) Improved utilization of port storage facilities, equipment and manpower resources. Introduction of a more efficient tallying operation.
- (e) Improved ship loading/discharging performance, reducing vessel turn-round time and leading to improved utilization of the ship cargo carrying space.
- (f) Reductions in cargo damage, pilferage and deterioration will result in lower insurance premiums. Improved transit time of cargo will provide greater reliability and hence reduced inventory levels.

Impact of unitization on port facilities and services in developing countries

In view of the fact that a considerable amount of cargo moving through developing country ports is still handled in break-bulk general-cargo vessels, it is perhaps expedient to examine possible improvements in this system before considering unitized cargo systems.

Methods to improve general cargo productivity

Significant improvements in cargo-handling productivity, often accompanied by reduced unit costs, have been achieved in many trades in the past decade. This has been accomplished by the move to bulk shipments, taking advantage of economies of scale, and by the introduction of unitization. The use of mechanical handling equipment on a large scale has been another contributory factor. During this time, conventional general-cargo berths in developing countries, while improving performance, have experienced no such significant improvements in annual berth throughput. This has taken place against a background of continual rising costs and the frequent imposition of freight surcharges as a result of port congestion.

The most common form of indicators used by ports to measure performance are:-

- (a) The annual berth throughput in tons;
- (b) The tonnage handled per linear foot/metre of quay;
- (c) The tons handled per gang/hour or gang/shift.

The quantity of cargo handled per linear metre of quay varies with the nature of the cargo, but rates of 400-1,500 tons per annum are typical. The number of tons loaded or discharged per gang-hour varies quite considerably, but average performance of 10-12 tons per hour is typical. Using these statistics and making certain valid assumptions, the intrinsic capacity of a general-cargo berth may exceed 250,000 tons per annum. In practice, the average annual berth throughput in developing countries seldom exceeds 120,000 tons. The general-cargo berth offers considerable scope for improvement to take advantage of spare capacity.

In addition to the obvious objectives of reducing ship turn-round time and port costs, you should consider the following points when adopting new working methods:-

1. The elimination of the arduous features associated with the handling general cargo.
2. Methods to reduce the amount of damage to cargo in transit.
3. To ensure safe working practices.

What can the shipowner contribute to improved berth throughput

The shipowner can contribute in a number of ways:-

1. In the design of his vessel and the equipment placed aboard.
2. By providing comprehensive cargo information

well in advance of ship arrival.

3. By encouraging new methods of handling, e.g. pre-slinging.

A modern well-equipped cargo liner with automatic hatch covers, deck cranes and large hatch openings can reduce the time lost as a result of unproductive activities. The provision of flush decks, permanent dunnage and adequate securing devices can also reduce delays. This allows greater use of mechanical handling equipment in the ship's hold and a reduction in damage to cargo. Shipowners benefit from reduced time in port, but some port authorities are openly encouraging this trend by offering advantageous rates.

Methods adopted by stevedores, terminal operators and port authorities

These can be conveniently grouped under three headings: (1) organizational improvements, (2) cargo-handling practices, and (3) labour productivity.

1. Organizational improvements

[a] Pre-arrival planning

Pre-arrival planning, based on comprehensive information supplied by the shipowner or his agent is a prerequisite for efficient cargo operations. This is extremely important when heavy lifts or special cargoes are handled or when heavy demands for mobile plant are made. A certain amount of planning, through the daily berthing and operations meetings, is already undertaken, but insufficient consideration is given to detail and the preparation of a cargo-handling schedule. This could lead to better use of resources.

[b] Allocated and appropriated berths

The appropriated berth is one which the port authority agrees to make available to a particular shipowner or liner conference on a preferential but not exclusive use basis. An annual rental charge is made, based on the area of land placed at the disposal of the shipowner and the sheds or buildings provided for his use. This is paid in addition to the normal docking, wharfage and cargo-handling costs. This system has the following advantages:-

1. The berth can be adapted and equipped to meet the specific needs of the shipowner or conference. It encourages investment on their part.
2. It provides an opportunity for the shipowner to organize his work schedules in advance.
3. Shippers, transport undertakings, etc., become conversant with the companies' requirements and working procedure. It provides a "home" for the shipowner.
4. It provides the port authority with an additional source of revenue.

This system has certain other administrative advantages for the shipowner, but, from the point of view of the port authority, has one major disadvantage — the resultant loss of flexibility.

The allocated berth is one where a terminal operator or stevedore is allocated a specific berth or berths at which to carry out his operations. Private stevedores are itinerant, moving from berth to berth as cargoes or vessels become available and often avoiding the problems that result from their actions. The system of allocated berths has the following advantages:-

1. By restricting the stevedore to one berth, he is forced to consider the long-term problems that arise, particularly in the event of congestion.
2. Rationalization in the use of equipment and centralization of maintenance facilities.
3. More effective control and planning of the labour force.

[c] *Acceptance and closing date procedure*

This is widely practised in liner trades where a given number of days are set aside for receiving cargo in advance of ship arrival. This system is often abused by shipowners and shippers, leading to congestion in the transit shed and placing additional pressures on the resources of the port. Consideration should be given to reducing the period of acceptance and the introduction of consolidation centres.

[d] *Vehicle appointment schemes*

The random arrival of road vehicles results in widely fluctuating demand for labour and equipment in the receiving areas which often exceeds the terminal handling capacity and leads to delays. This is aggravated by the existence of hundreds of shippers who deliver small consignments well below vehicle capacity. Vehicle appointment schemes attempt to regulate the arrival rate of vehicles to obtain maximum utilization of loading bays and equipment and to improve deployment of labour. It requires the setting up of a port information service to give advice and instruction to shippers, transport undertakings etc. and can encourage the shipper to rationalize transport requirements, reducing the number of vehicles entering the port. The advantages of vehicle appointment schemes are:-

1. The elimination of terminal delays to road transport.
2. Better use of facilities and equipment.
3. Avoids traffic congestion and interference.

Pre-booked cargoes are given priority and, in some cases, advantageous rates are applied.

2. *Cargo-handling practices*

[a] *Shipboard organization*

The rate of handling from quay to ship's hold is dependent upon two factors:-

- (a) The crane or derrick cycle.
- (b) Average weight per lift.

The theoretical capacity of the lifting equipment is 40 tons per hour, assuming a crane cycle of

three minutes and an average lift of two tons. While most equipment is capable of safely lifting two tons, the quantity of cargo per lift is often volume-restricted. In practice, lifting equipment can be idle or used for non-productive activities for over 40 per cent of the time. Consideration should therefore be given to reducing the amount of time spent in unproductive activities, hook delays at the quayside or in the ship's hold and the need to increase the payload per lift.

1. Improved organization of labour in the ship's hold.
2. The establishment of cargo reservoirs in the hold and on the quayside.
3. The use of mechanical handling equipment, roller conveyors etc. in the ship's hold, particularly for cargo stowed in lockers or in the hatch wings.
4. Reduction in unproductive activities undertaken by the on-board gang, e.g. dunnaging, securing cargo, and the unproductive time of the hook. Pre-slinging of cargo reduces delays from this cause.

To reduce costs and improve throughput, the handling of cargo in transit should be reduced to a minimum. This can be attained by using dock or stevedore's pallets (72" x 48") where cargo loaded in the ship's hold remains on the pallet until transferred to road/rail transport, or, in some cases, until delivered to customers' premises. In many ports in developing countries, cargo is loaded on pallets and broken down again two or three times in the course of transit. This results in additional handling costs which can often exceed the cost of replacing pallets which are lost or damaged.

[b] *Tally operations*

Delays to cargo frequently occur as a result of the antiquated methods used for checking and sorting cargo. The vast number of shipper's marks appearing on a manifest are rigorously checked to provide an "out-turn", the accuracy of which is questionable. Three methods of reducing delays as a result of this cause are:-

1. Abolish tallying. In a number of ports this has been achieved without the significant increase in the number of claims predicted.
2. Joint tally (accepted tally). In ports where the responsibility for cargo operations is divided between stevedores, private warehousemen and port authorities, a tally carried out by one of the principals is accepted by the others and avoids duplication.
3. In stack tally. In this system, cargo is removed directly from the ship to the shed where the tally takes place. It is best suited to palletized cargo since the tally clerk can walk along the stack

and quickly identify shipping marks and quantities.

3. *Labour productivity*

The handling of general cargo remains a labour-intensive activity. Costs directly attributable to labour can amount to 40-50 per cent of total handling charges. Increased output per man as the result of more efficient deployment of manpower resources has the added attraction of reducing the major cost element in cargo handling. The major reasons that account for low output per man are:-

[a] *Flexibility of labour*

An agreement between management and unions to adjust the gang strength for different commodity classifications and the ability, within certain limits, to move labour from one operation to another to meet temporary imbalances has obvious advantages. The gang strength depends upon the commodity mix ratio and the labour task identified. The ability to offer shipowners three-shift working and the labour's agreement to eliminate restrictive practices, particularly the "welt" and "continuity rule", offer further advantages. The practice in many ports where overtime is worked is to allow the same gangs to work through. As a result of fatigue, productivity, particularly in the night shift, falls well below the figures that could be achieved if fresh gangs were employed.

[b] *Incentive schemes*

A division of opinion exists on the merits of incentive schemes. The advantages put forward are: (a) increased productivity, (b) high rewards for more productive workers, (c) ability to earn more than on a straight time-wage basis. The arguments against rest on the social consequences and the abuses it may lead to.

The most common forms of payment system adopted in ports are:-

1. Piece rates (including differential piece rates).
2. Time rates.
3. Bonus systems.

[c] *Unproductive time*

The largest single reason for delays or reduced output per worker is unproductive activities. In many ports, the lack of agreement in standardizing working hours between the many organizations involved leads to unnecessary lost production. The amount of time devoted to rigging gear, opening hatches and preparing the holds for work is another major item. The use of a rigging gang with the responsibility of preparing the ship for cargo work before the labour arrives is one solution to the problem. But many unproductive activities and restrictive can be eliminated by closer supervision.

Palletization

A logical extension to conventional general cargo handling is the introduction of palletization. This form

of unitization provides the least capital-intensive system of unitization since palletized cargo can be carried in conventional vessels and handled at existing port facilities. However, a number of specially-designed palletized vessels are now in service which rely upon horizontal movement of cargo through ship side-doors as opposed to the conventional vertical loading procedure by means of ship derricks or cranes. The ship's holds are specifically designed to maximize space utilization of palletized cargoes and all quayside and shipboard transport of cargo is performed by fork-lift trucks. In this system, quayside fork-lift trucks place cargo on to an elevator in the ship's hold through the ship side-door and this is removed and stowed by shipboard-based fork-lift trucks.

The full economics of palletization are secured when pre-packed shipper units are moved upon the same pallet from shipping to consignee. The use of pallets is nothing new to the ports industry where 'dock-side' pallets have been the traditional equipment of stevedores for decades. However, this system ensured that the pallet remained in the port and hence cargo was made up and broken down on a number of occasions during transit. The advantages of through pallets are clearly appreciated by port authorities who offer substantial discounts for palletized traffic and give priority to this traffic at cargo reception facilities.

Factors to be considered when introducing palletization are:-

- (a) Conventional vessels may be used, although the trend is to provide specially-designed vessels.
- (b) Existing port facilities may be quickly and inexpensively adapted to meet the needs of this trade. It avoids major capital investment in port infrastructure and superstructure.
- (c) A berth throughput of 250,000 tons can be achieved at berths designed to handle palletized traffic.
- (c) Palletization is suitable for multimodal transport.
- (e) Consideration must be given to the type and size of pallets utilized, and to the policy of using disposable or returnable pallets. This raises the problem of pallet identification and allocation schemes and the introduction of pallet pools.

Barge-carrying vessels

Initially introduced on the North Atlantic trade, the principle of barge-carrying vessels is growing in popularity and services to the Far East are already in operation. This system separates the maritime link from the port-handling system as the barges are normally discharged by means of shipboard crane from the mother ship and transported to the point of cargo discharge. This reduces the capital investment commitment on the port authority since the mother ship is normally secured to a buoy in deep and unrestricted waters and the barges are discharged at conventional general-cargo berths. This avoids the provision of expensive port infrastructure and, in some cases, superstructure, although the increasing

trend to stow containers in barges implies the need for sufficient crane capacity. Barges when discharged are normally towed to the port or consignee's premises by means of tugboats.

Although many ports handle barges at conventional facilities, United States Gulf ports are providing specialized terminals designed to handle cargo from these barges. Lash barges have a capacity of 370 tons and, with an average handling rate of 3 barges an hour, it is possible to discharge 1,100 tons an hour. While port investment is substantially reduced in this system, the vessels themselves are more expensive than cellular container vessels. However, the vessel spends very little time in port (often under 12 hours) since discharged barges remain in the port for loading and are picked up on the subsequent voyage.

The barge-carrying system has distinct advantages for countries with well-developed inland waterways or island archipelagos where barges can be towed directly to the premises of shippers/consignees located adjacent to waterways. However, if barges spend an inordinate time in reaching and lying at the shippers'/consignees' premises, alternative cargo-handling arrangements may need to be made or investment in additional barges increased. While barge-carrying vessels represent considerable capital investment, the system is clearly attractive to developing countries since it avoids major expenditure. The fact that existing cargo-handling facilities and manning scales can be retained avoids many of the social problems associated with the move from labour-intensive to capital-intensive operations.

Containerization

Many developing country ports are currently rushing into containerization by providing new facilities where demand does not justify the capital investment. The corollary to this is underutilization of facilities and subsidization since a viable throughput of boxes is not secured.

In the lift on/lift off container trade, many ports are handling a comparatively small number of boxes reasonably efficiently at conventional berths with the aid of scotch derricks, floating or heavy lift cranes. The present traffic, much of which is still carried in conventional ships, does not warrant the provision of specialized equipment. The problem arises when the number of boxes gradually increases, making it inefficient and sometimes impossible to continue with this method. A new specialized terminal may be required, although it will be some years before the traffic will generate sufficient revenue to show a return on invest-

ment. It is this transitional period which often provides complex problems for the port authority in deciding alternative strategies. In an attempt to attract additional trade, keen competition between ports often proves counter-productive and leads to price undercutting.

Some ports have endeavoured to resolve this problem in a multistage process by initially providing the quay area and storage facilities to container berth specifications. When existing equipment is inadequate to meet demand, investment in superstructure has taken place, initially on a limited scale and with a view to expansion when and as the need arises. This solution may prove adequate for short-sea or coastal services, but may not be acceptable where deep-sea vessels call to load/discharge part cargoes. The high daily operating cost of such vessels will ensure that shipowners will put pressure on port authorities to provide the back-up systems to facilitate a quick dispatch. This problem is somewhat alleviated where container vessels are provided with their own gantry crane or where multi-purpose berths are provided to handle a range of homogeneous commodities requiring basically similar facilities.

The major initial problem is to determine how many boxes will move on a quay-to-quay basis as opposed to a door-to-door basis. Many container trades have experienced a high proportion of quay-to-quay movements in the initial stages until the trade has fully developed, after which this proportion diminishes. The problem is a little more complex in developing countries where the transportation infrastructure may not be capable of handling the volume of door-to-door units. The higher the proportion of boxes moving on a quay-to-quay basis, the greater the amount of cargo will be handled in the port by conventional means. This implies the need for adequate storage facilities in the initial stages, although this will be reduced as more boxes move directly to the customer.

Roll on/Roll off facilities have similar port infrastructure requirements to LoLo systems, although port superstructure requirements are less demanding. RoRo systems handle all traffic that is on wheels or can be placed upon wheels. Thus, containers, pallets, flats etc. can all be accommodated on a RoRo berth. Adequate storage area and back-up facilities have to be provided, including a specially-constructed ramp to provide access to the vessel. However, some of the more recent vessels entering into service are provided with an adjustable angled ramp which avoids the need for special facilities and can be used alongside conventional marginal quays. I shall return to the subject of containerization in the subsequent lecture when I shall discuss this mode in greater detail.

THE PLANNING AND MANAGEMENT OF CONTAINER TERMINALS*

The introduction of containerization on many of the world's major maritime trade routes has significantly altered the traditional landscape of ports and introduced new concepts in cargo handling. Following the initiative of Matson and Sealand, shipping consortia and port authorities are investing large sums of money in purpose-built facilities for the exclusive handling of containers. The economics of containerization rest on high utilization of the specialist vessels built for the trade and greatly improved productivity in the terminals designed to accommodate them. The loading and discharging of general cargo carried in conventional ships may take days or even weeks, while this can now be accomplished at container terminals in a matter of hours.

This lecture is not intended to advocate, or advise against, the introduction of containerization in developing countries. It sets out to provide guidelines and recommendations for the planning and efficient management of terminals. For, despite the division of opinion that exists on the merits of containerization on trade routes linking developing countries, many port authorities have constructed or plan to construct berths of container specifications with a view to handling this traffic in the future. The merits and disadvantages of the various systems of unitization of cargo have been discussed in a previous lecture, but I feel it expedient to repeat here some of the salient factors which should be considered when contemplating the introduction of containerization:-

1. Wage rates in developing countries are significantly lower than those paid to dockworkers in more developed countries, and the economic benefits are therefore not nearly so attractive.
2. Large imbalances of trade exist between most developing and developed countries.
3. It is doubtful whether many major commodities, particularly exports from developing countries, are suitable for containerization.
4. The existing transport infrastructure is inadequate to allow door-to-door delivery and hence the financial benefits are not fully realized.

Containers and container ships

Three types of ship can be identified in the "lift on lift off" container trades:-

- the conventional general-cargo ship which carries a limited number of containers on deck or in the hatch squares;
- composite vessels which are frequently converted tankers or bulk carriers;
- specialized 'cellular' vessels.

The type and amount of equipment required and the layout of the terminal will depend to a large extent on the type of vessel employed in the trade and the size of containers handled. Time-consuming adjustment to equipment, e.g. the need to adjust spreaders to take 20' or 40'

containers, must be reduced to a minimum. ISO recommends the use of containers with lengths of 10, 20, 30 and 40 feet with an 8' × 8' cross section. However, while these are the popular sizes, individual operators have introduced containers with a wide range of dimensions to meet trade requirements and to ensure compatibility with other modes of transport. Some typical dimensions are:-

35' × 8' × 8' 6"

24' × 8' × 8'

8' × 8' × 8'

In recent years, the proportion of 40' boxes has continually increased and, on some trades, constitute some 60/70 per cent of all boxes. A further development has been the increasing range of specialized containers constructed to meet the specific needs of commodities, e.g. bottom discharge containers for bulk products.

Common user or exclusive user berths

The decision to provide common user or exclusive user terminals will depend upon the financial provisions, the volume of trade, the frequency of sailings and the compatibility between trades. Shipping consortia normally develop a terminal for their exclusive use, while port authorities, for financial reasons, may have to allow a number of operators to use the berth.

Available statistics from existing terminals indicate that single user berths are far more productive than common user facilities.

Planning container terminals

Container terminals have extensive land requirements. Modern terminals designed for deep sea trades may have berths occupying 25-40 acres of land. The length of the berth and the depth of water alongside will depend upon the size of vessels, but lengths of 800-900 feet and depths of 35 feet are common today. The size of terminal depends upon the volume of traffic handled, the stacking height of containers, the back-up system adopted and the in-transit time of containers, i.e. the disposal rate. When first planning the terminal, certain objectives should be observed.

1. The system adopted should minimize capital expenditure while remaining capable of handling the volume of traffic expected.
2. Operating costs must be kept to a minimum.
3. The design should incorporate a degree of flexibility to allow for further expansion and the introduction of an improved system.
4. The terminals should minimize land usage. (This must be considered in conjunction with objectives 2 and 3.)
5. The terminal should be provided with good road/rail access facilities to reduce congestion and traffic interference.

A typical container terminal should provide the following facilities.

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Storage area for containers

- (a) In existing terminals this occupies 55-65 per cent of total area.
- (b) Area depends upon stacking height, "in-transit" or dwell time and back-up system adopted. Also provision of inland consolidation terminals.
- (c) The objective should be to reduce terminal movements of containers. (Ideally, containers should be moved twice — once into the terminal and once out. In practice, the average number of movements is 2.5 to 3.0 times for a container in transit.)
- (d) In designing a terminal, a rule of thumb method of ensuring adequate storage area is to provide 2.5 to 3.0 times the container capacity of the vessels using the berth. A further guideline for determining storage area requirements is 100 boxes /acre/week.
- (e) Storage areas and necessary facilities for specialized containers, e.g. refrigerated containers.

Stuffing and stripping sheds

- (a) Size depends upon the number of containers moving on a quay-to-quay basis and the existence of consolidation centres.
- (b) In existing terminals, this occupies 20-30 per cent of total area but will depend upon the proportion of boxes moving on a quay to quay basis.
- (c) Must be provided with adequate storage facilities for break-bulk or palletized cargoes (e.g. racking systems).
- (d) Compatible with road/rail transport and should lead to easy access for terminal equipment, e.g. open-sided sheds, loading platforms at tail-gate height, flush surface with quay.

Administrative blocks, maintenance and repair shops

Provision must be made for:-

- (a) Reception and delivery centres which allow for good communications.
- (b) Container repair and cleaning facilities.
- (c) Equipment maintenance facilities.

Marshalling area or operational zone

Consideration must be given to the need for:-

- (a) Sufficient area to marshall containers.
- (b) Avoid congestion and traffic interference.
- (c) Allow access by road vehicles and, in some cases, rail wagons.
- (d) Parking areas for inland transport vehicles.

Back-up systems

Numerous systems for moving containers within the terminal are available. These will be discussed in detail below. However, all container terminals have one feature in common — the provision of a quayside gantry crane

of 35-40 ton capacity for the loading and discharging of containers from ship to quay. In some smaller terminals, particularly where the volume of traffic does not justify the provision of gantry cranes, Scotch derricks have been used as an alternative.

Whilst crane cycle times of 50 lifts per hour have been claimed, in practice the sustained cycle time is approximately 20 lifts per hour. In the larger terminals, two gantry cranes are provided, but, at roughly £300,000 each, the volume of trade handled must be high to justify this expenditure. The handling rate from ship to quay can be improved in two ways:-

1. Adopting 'twin lift' principle. In this method, a spreader capable of lifting two containers from adjacent cells is provided.
2. To adopt a predetermined plan of operations. The usual procedure is to discharge one cell completely, then, as the next cell is discharged, a container can be loaded in the empty cell. This calls for a high degree of control of movement of containers within the terminal, but does not provide 100 per cent improvement in productivity, because part of the crane cycle time will be spent siting the container over the cells.

Crane manufacturers claim that, with existing back-up systems, the modern gantry crane can handle up to 1,000,000 tons per annum (average 10-12 tons payload per container). Very few cranes reach this level, perhaps because of insufficient traffic demand, but, in some berths, 460,000 tons per crane have been achieved, a realistic figure given present terminal equipment performance.

Chassis systems (Sealand)

Originally developed by a company heavily dependent on road transport. With this system, the container is lowered from the crane on to a chassis on which it remains until it leaves the terminal. The chassis is towed by a tractor unit while in the terminal. This system has the following characteristics:-

- (a) Low land utilization (approximately 70 containers per acre storage requirement).
- (b) Very good accessibility.
- (c) Ideal for small terminals.
- (d) Incorporates a great deal of flexibility.
- (e) Comparatively cheap.
- (f) Reduces amount of handling and hence risk of damage.
- (g) Low maintenance costs.

Straddle carriers (Matson)

This system is ideally suited to throughput up to 30,000 boxes per crane per annum and is the principal method of operation in container terminals. Containers are discharged from the ship to the quay and moved to the place of storage by a straddle carrier, a piece of equipment specially designed for this task. Variations on this system include the use of fork-lift trucks, side or front loaders. Characteristics of the system are:-

- (a) High land utilization (90 boxes per acre stowed one high). Straddle carriers can stow containers three high with a minimum of space required between rows of containers. However, this can slow down operations.
- (b) Damage to crane equipment, containers and the carrier is high as a result of poor equipment design.
- (c) Poor accessibility.
- (d) Expensive.
- (e) Difficulties experienced handling containers to other transport modes, particularly rail vehicles.
- (f) High maintenance costs.

Transporter crane system

Ideal for small container terminals possibly handling coastal or short-sea trades. In this system, the quay crane straddles the storage area and obviates the necessity for additional equipment. The crane can move containers direct to road/rail transport without going to storage and when the berth is empty can be used to move containers in the storage area. Characteristics of this system are:-

- (a) High land utilization (120 boxes per acre stowed one high).
- (b) Reduction in amount of equipment required.
- (c) Poor accessibility.
- (d) Longer crane cycle experienced.

Transtainer systems

More modern design which is ideally suited to high throughput up to 50,000 containers per annum. Transport between quayside and storage area is provided by chassis or straddle carrier system with transtainers

provided in the storage park and transfer terminals. Transtainers can be either rail-mounted or rubber-tyred with reasonable manoeuvrability. Characteristics of this system are:-

- (a) Suitable for high volume of traffic.
- (b) High land utilization (130 boxes per acres stowed one high).
- (c) Expensive.
- (d) Good accessibility.
- (e) Ideal for transfer to road/rail vehicles.

The system adopted in your port depends upon a number of factors which include present and future traffic forecasts, method of operation, obsolescence and versatility of equipment, e.g. perhaps adapted for use on bulk cargoes. Some typical berth throughput figures will be discussed here.

Terminal management

Terminal management delays can lead to considerable lost throughput and increased costs. The sophisticated handling systems discussed above in conjunction with high throughput rates provide a complex operation which requires detailed planning. Points which should be considered when planning terminal operations are:-

- (a) Traffic control (ensure orderly delivery and reception operation);
- (b) Segregation of empty, export and import containers;
- (c) Identification and control of containers (E.D.P. or card index systems);
- (d) Communications within the terminal (central control office linked by radio to equipment operatives and transfer terminals);
- (e) Storage patterns (right-angled or herring-bone systems);
- (f) Supervision of stuffing and stripping operations.

TECHNIQUES OF MARKET RESEARCH*

Introduction

A successful marketing and planning policy relies on information — comprehensive and detailed information on the relevant factors influencing the ports' major trades. A corollary to this, particularly since increasing emphasis is being placed on medium-term and long-term planning, is the development of more sophisticated or improved methods of forecasting, especially in high-technology industries.

In this respect, one of the greatest problems confronting an industry is innovation and rapid technological change. These problems are all the more demanding in industries which, in the past, have experienced a relatively minor or a slow rate of change and where, as a result, operational practices and, perhaps more important, attitudes have become entrenched and resolute. Indeed, the future development of the industry or individual port may largely depend upon the way in which management adapts to meet new conditions and circumstances.

The maritime transport industry is currently operating in an environment of rapid technological change. It is essential, therefore, for management to be fully aware of changes taking place in the underlying structure of major trades and the associated technology. An appreciation of port user attitudes and trading practices is also necessary if port authorities are to provide the facilities and services required by existing and potential users in the future.

The fact that conditions are constantly changing in world trading patterns and shipping and transportation technology implies that there is a premium for port authorities who can anticipate or detect changes before they are fully realized. Market Research is a technique that assists management in the process of continued research and evaluation and provides a constant assessment and review of the ports' commercial and operating policies.

Definition of Market Research

It has been well defined by E.E. Pollock who states that "Market Research is neither more nor less than a way of ascertaining the market, the level or pattern of demand for a commodity; in the present context, for the facilities and services of a port or network of ports. In this way, it is potentially an important marketing tool for the ports industry, an industry where marketing manpower must necessarily be a scarce commodity in relation to the very large number of users and potential users. In such a situation, it is especially important to pinpoint the traffic flows, the users or groups of users who potentially could be attracted to a port, and who are sufficiently large to justify the marketing effort involved."¹

Possible objectives of Market Research

Market Research is employed in a wide range of industries and business environments and is used to study both existing and possible future situations. For example, it may be used to conduct a study on present port user storage problems or alternatively to ascertain the demand for new facilities and services. However, it is more likely to be used to study problem areas where the financial return resulting from problem solving are commensurate with the time and resources employed. The fact that Market Research has such a wide application means that, in practice, a particular study may incorporate a number of principal and secondary objectives. However, the following far from exhaustive list has the most frequently encountered objectives in research studies:-

- (a) The size, composition and trends of markets or specific trades.
- (b) An investigation of port user requirements for facilities and services. Research has clearly shown that, collectively, the attitudes of port users towards the provision of port services is of paramount importance in choice of port. These studies will take into consideration the physical, economic and operational factors of major influence.
- (c) To identify demand characteristics for new facilities or services.
- (d) To determine the role of port users in individual trades (e.g. deep-sea trades, bulk trades) and the commercial and trading practices.
- (e) A review of general economic trends or business activity.
- (f) Specific project studies.
- (g) A review of competitors' activities and image studies. This includes comparative studies.
- (h) Investigation of the pricing or charging policy of the port authority and the influence of port costs on total distribution costs. Identification of elasticities.
- (i) Advertising and promotion campaigns.
- (j) A determination of Decision Making Units (DMU).
- (k) Identification of hinterlands and catchment areas.
- (l) Reasons for lost business.

The research design

Whether Market Research is conducted by staff employed internally or with the aid of consultants, the objectives and work plan of the study will be contained in the project document. This is formulated following consultations with interested parties and, in addition to containing the background to, and reasons for, the study, will include a statement on the following aspects:-

- (a) The terms of reference.
- (b) The principal and secondary objectives of the study.

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- (c) The research methods to be adopted.
- (d) The time and cost involved.
- (e) Details of the content of the final report to be submitted.

This document provides the guidelines and specification of the research project and, in the case of consultants undertaking the research, is some form of insurance for the client. It is important, therefore, to ensure that this document is clear and unambiguous, specific and relevant, particularly in respect of the methods of study and content of the final report.

Techniques of Market Research

[a] Desk or secondary research

This includes a comprehensive literature search of relevant journals and publications, particularly of work undertaken in the past on the subject under investigation. It is during this very important first stage of the research that the background to the study is considered in depth, and where the researcher begins to identify the salient factors in the study. The use of internal data should be encouraged where it is available. External sources include government publications, trade journals, research bulletins, banking and other institutional publications and subscription services. This list is not exhaustive since the availability and source of material will depend upon the subject matter of the study.

[b] Postal surveys

The most prolific technique used in Market Research is the postal questionnaire. This offers a relatively inexpensive but not always successful way of collecting data. You must ensure that the type of data you require and the nature of the industry you are investigating can be adequately covered by this technique. Used properly, postal questionnaires can be extremely valuable, but, used wrongly, they can be almost worthless. Postal surveys require a high degree of skill not only in the technical content but in the formulation of the questions. The following are the salient points to be aware of:-

- (a) Sampling techniques.
- (b) Structure of the questionnaire, particularly the types of questions, e.g. dichotomous, multiple-choice and open-ended.
- (c) Identification of the decision-making unit.
- (d) Pilot study to test postal survey.
- (e) Methods of analysis.

[c] Personal interviews

This is perhaps the most important technique of market research where the breadth and depth of information is obtained. Interviewing is a skill which, if developed successfully, will lead to an increased exchange of information. Personal interviews may be conducted in the following ways:-

- (i) Structural interviews
 - Where the interview format and specific questions are agreed beforehand. This is a rigid

procedure, used extensively in consumer market research, which is less open to personal bias.

(ii) Semi-structural interviews

In this method, the specific questions are agreed beforehand, but the interviewer has some freedom in the order and method of relaying the questions.

(iii) Non-directive interviewing

This is a free-ranging discussion without the constraints imposed by structured interviews but obviously more open to the influence of personal bias.

(iv) Telephone interviewing

Often the personal interviews and data collected from the postal survey are substantiated and complemented by a series of telephone interviews.

Forecasting

Since the emphasis within the lectures on Market Research has been placed on planning, I felt it appropriate to briefly mention some techniques of forecasting frequently used by the researcher.

Time span for forecasting

The time over which forecasts are made will vary with the nature of the industry. However, it is fairly common to find forecasts prepared for the following time spans:-

[a] Short-term forecasting

In this type of forecasting, management are principally interested in day-to-day information in an attempt to balance the demands placed upon the organization.

[b] Medium-term forecasting

Usually covers the period 2 to 10 years ahead and is principally reviewing the competitive position and demand characteristics for facilities and services.

[c] Long-term planning

This type of planning looks at the time span 10 years and ahead, and provides the most intractable of problems.

Methods of forecasting

- (a) Exploratory forecasting techniques which include:
 - (i) Trend forecasts.
 - (ii) Time series analysis.
 - (iii) Physical and mathematical models.
- (b) Comparative forecasting.
- (c) Scenario techniques for long-term planning, particularly the forecasting of technological change.

GUIDELINES FOR THE ESTABLISHMENT OF PORT OPERATIONAL PERFORMANCE INDICATORS*

Introduction

The importance of the establishment of "port performance indicators" was emphasized by the UNCTAD secretariat in its document entitled "Port statistics" in 1970. The Expert Group on Port Statistics appointed by the secretary-general of UNCTAD in September 1970 also stressed the need for the establishment of performance or efficiency indicators so that the costs of port operation and the performance can be kept under review. In the UNCTAD document entitled "Berth throughput", issued in 1973, the important role of the performance indicators was also analysed. The ESCAP secretariat has designed a methodology for the collection of these indicators as far as possible on a uniform basis, and a pilot study has been undertaken at four typical ports of the region to test the effectiveness of the methodology.

It is essential for the port authorities to know whether their services to the port users are improving or not. It is through a set of performance indicators that the port authorities will be able to measure the extent of the improvement or the deterioration of the services they are offering to the port users. As a port authority is a complex organization, varying in its structural activities in accordance with socio-economic conditions prevailing in the countries, it is not desirable to judge the performance by only one figure, and therefore a series of performance indicators are needed. These indicators must be able to supply information not only on the quality of services offered to the shipowner shipper but also how the port facilities and scarce resources are being used. In other words, they should spotlight the degree of waste. The importance of a particular indicator varies according to the technical characteristics of berths and other facilities.

The following may be broadly categorized as important performance indicators for the purpose of improving port operational efficiency and to assist in port planning:

1. Labour productivity
 - (a) Stevedoring
 - (b) Lighterage
2. Turn-round time of vessels
3. Throughput per berth
4. Berth occupancy
5. Equipment utilization rate
6. Cost of cargo handling per ton

1. Indicators of labour productivity

[a] Stevedoring

Stevedoring productivity is measured in terms of deadweight or shipping tons per gang-hour. Large

number of ports of the ESCAP region compute this information on a deadweight tonnage basis. However, it is recommended that, for port-to-port comparison, the computation be made in terms of man-hours, not gang-hours, as the size of the gang varies from port to port. It is the ratio of output to input (in gang-hours) during a given period for a given type of cargo. As the port authorities are keen to improve the productive capacity of their labour force, it is essential to measure the present capacity as far as possible in very accurate terms according to the type of packaging. In measuring the performance rates of the stevedoring gangs, it is absolutely essential to compute the output rates for *gross working time* and *net working time*. This will enable the authorities responsible for stevedoring operations to assess the magnitude of the prevalence of the labour-restrictive practices in the ports of the region, which is a serious impediment to the effective improvement of port operations to achieve speedy turn-round of shipping. The gross working time is the period during which the stevedoring gang is expected to be present for work aboard ship from the start of each shift to the end. This has to include the time spent on auxiliary operations and the time losses, including those incurred by men leaving early. The difference between the net and the gross output per gang-hour reflects the degree of prevalence of labour detentions within the working time.

[2] *Methodology for the computation of "net" and "gross" output for a given commodity*

From the tally sheet, i.e. the document showing a record of the packages loaded or unloaded from a vessel, the required particulars can be entered in a form entitled "Daily output statement" (annex I). The particulars needed for the computation of net and gross productivity are available on this form. It will be seen from annex I that the quantum of cargo discharged from a vessel is shown separately according to the shift on a hatch-to-hatch basis, with a corresponding input of gangs. Gangs subject to detentions will be recorded with duration of such detentions. The tonnage discharged divided by gross gang-hours will be the gross gang-hours will be the gross output per gang-hour and the tonnage divided by the net gang-hours (i.e. excluding the detention etc.) will be the net output per gang-hour.

The concept of net and gross labour productivity is important for management purposes, so that the port authorities can take corrective measures to narrow the gap between the net and gross output to the minimum level. Among developing ports of the ESCAP region, the port (cargo) corporation of Colombo, the Calcutta Dock Labour Board and the port authorities of Bangkok compile the stevedoring productivity information on a net and gross basis. In Colombo, the computation is being done not only according to major categories of cargo, such as rice, flour, sugar, fertilizer, iron, general cargo, tea and rubber, but also according to the different

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operating shifts. By this method of computing the stevedoring productivity separately for shifts, it is possible to identify the particular shift which is less efficient than the others, so that the management can look into the problems of the inefficient shift to improve the operational efficiency. The pilot study recently undertaken in the ports of Jakarta, Kelang and Bangkok has revealed that productivity computation is far from satisfactory. In Jakarta, the port administration does not have any information pertaining to stevedoring productivity. Moreover, unlike other ports of the region, the stevedoring operations are being performed by the shipping companies. In the port of Kelang, the productivity information is available on an over-all basis and not separately according to the type of packaging or commodity. The computation does not take place according to the different shifts, but on an over-all basis of three shifts. As a result of this system, the Kelang port authorities are unable to identify the particular shift which is operationally less efficient. In addition, the stevedoring authorities are unable to determine the cargo-handling rates separately for general cargo, drums, timber, bags, iron and steel, rubber etc. However, the information is available on an over-all basis. Annex II is the format recommended for presenting the net and gross stevedoring productivity information monthly to the port management for various types of cargo for different geographical areas of the port on a shift-wise basis.

[ii] Benefits of the computation of net and gross stevedoring productivity.

The port management must know the actual output rates of its labour force before it can effect any improvement in the productivity standards. As the computation of stevedoring productivity in terms of net and gross output per gang-hour is a valuable and sophisticated yardstick to measure the output of the labour force, this method of computation is strongly recommended. Another important benefit arising from this computation of productivity is the advantage of having a comparison of performance of stevedoring labour of a given port with that of another comparable port. If labour productivity information is not available in sophisticated terms, port planning may make faulty assumptions. This point may be illustrated by the following.

Let us suppose a port is subjected to serious congestion due to inefficient operation resulting from labour indiscipline and maladministration. In order to avoid the imposition of freight surcharge on it by the various shipping conferences, this port's management is likely to plan the construction of additional berths to ease the congestion, but at the cost of a huge capital outlay. However, if the productivity information is readily available on sophisticated lines, the port management may introduce incentive schemes to raise the current productivity level so that the total volume of traffic can be increased. This measure will require neither additional recruitment of labour force nor construction of additional berths. It can be further illustrated in the following figures for a given port on a

hypothetical basis. The condition of the port when the congestion exists is as follows:

Situation	Labour force	Number of berths	Volume of total output per day: shift of 8 hours	Productivity
Congestion	100 gangs of 15 men each	20	4,000 tons	5 tons per gang-hour (gross)
After the introduction of incentive scheme (no congestion)	100 gangs of 15 men each	20	5,600	7 tons per gang-hour (gross)

From the above illustration, it is clear that no scheme can be scientifically designed to increase the productivity level by offering an attractive incentive bonus scheme to the stevedoring labour unless the present output rates are statistically measured. In the absence of this vital productivity information, there is a distinct possibility that the port authorities may not only construct additional berths but also recruit additional labour. The port management can statistically measure the performance of the existing incentive bonus scheme only if there is a computation of stevedoring productivity in terms of gang-hours. By using this yardstick, the authorities can easily find out statistically the number of gangs achieving the prescribed incentive bonus target and their corresponding output rates. The criteria to judge the efficiency of port operation can be gauged from the statistics on gang-hour stevedoring productivity.

[iii] Interpretation of the difference between net and gross stevedoring productivity

There will be no difficulty in computing the net and gross stevedoring in terms of gang-hour and man-hour output if the relevant data are available in the daily output returns showing clearly the nature of detentions that have taken place and the duration. Some of the detentions are avoidable on the part of labour while others may be due to factors beyond the control of labour, such as causes attributable to ship, lack of equipment, break down of equipment, weather constraints and administrative delays (e.g. stevedoring operations will be affected at quays if there is a delay of lorries to take delivery of the cargo). Therefore, one should be very careful in arriving at any conclusion on the difference between the net and gross stevedoring productivity. In this context, the Kelang port authorities maintain their statistics of detentions on a monthly basis, broken up into three categories: (a) delays caused by rain, (b) delays for which the agents are held responsible, and (c) delays for which the port is held responsible. In October 1974, 4 per cent of the total-gang hours were affected by rain and nearly 8 per cent were affected by delays attributable to the agents, while only 3 per cent were affected by delays attributable to the port authority.

One can also compute the net and gross stevedoring productivity of a given ship during its entire period of cargo-handling operations by dividing the total

tonnage of cargo handled by the total number of gross and net gang-hours.

The shipowner, however, would be interested in gauging the stevedoring labour productivity from a different angle. It is only natural for him to find out the average tonnage discharged or loaded either in terms of ship hours or ship days. This has to include all the hours or days in the port whether the ship works or not. Further processing of this type of productivity information could be made available for ship working hour/day and ship hour/day at berth. The details of compiling this type of data depend on the particular circumstances prevailing in each port. In Colombo, the productivity information is also available on a net and gross basis, not only on cargo groupings on a shift-wide basis but also for berth groups. This assists the management in investigating why the productivity level should differ between various berth groups for the same cargo classes.

[b] *Lighterage operations productivity*

There is hardly a single port in the region which computes the lighterage operation productivity rate either for landing cargo from the lighter or for loading into the lighter. As in the case of stevedoring, the measurement can be in terms of shipping tons or deadweight tons per gang-hour. If the lighterage productivity is low, it can seriously hamper the stevedoring operations and thereby affect the turn-round time of the vessel. Even if the stevedoring operations are efficient, unless the lighterage operations are equally matched, the smooth operations of ships at moorings (stream berths) will be affected. This shows the importance of the smooth functioning of both the stevedoring and the lighterage operations. From the operational point of view, stevedoring operations will be slower than lighterage operations. In other words, the time taken for a ton of cargo to be loaded into or unloaded from a ship is more than the time taken for a ton of cargo to be loaded into or unloaded from a lighter. Having regard to this operational factor, it is vitally important that the lighterage operation productivity rate should not be so low as to cause any problem affecting smooth stevedoring operations. Therefore, for the over-all operational efficiency of cargo handling, statistics on the lighterage productivity of various types of cargo should be compiled. As in the case of stevedoring, it is also desirable to compute the productivity on a net and gross output per gang/man-hour basis. The computation of lighterage productivity will have to take place according to the various lighterage units in the port to compare the efficiency maintained at the various operational areas. This will enable the management to take remedial measures in the areas where the operational efficiency is rather unsatisfactory in terms of productivity statistics. It is essential to have statistics of the productivity rates of lighterage operations in order to have a "tie-up" with the productivity rates of stevedoring operations. This information is also important for decision-making processes regarding the construction of lighter berths and investment in lighters and other related facilities.

2. Indicators of ship turn-round time

This is the most important performance indicator to measure the commercial operational efficiency of a port from the point of view not only of the port authorities but also of shipowners. The shipowners would naturally prefer the port authorities to invest sufficiently to increase the commercial productive capacity of the port to obtain "speedy turn-round time" of vessels. The earning capacity of the vessel depends on the minimum number of days required either to load or discharge the given volume of cargo in the port.

It is necessary for the port authorities to have the information on the break-up of the turn-round time in order to identify the bottle-necks which retard the efficient operation of cargo-handling. With this purpose in view, the collection of data on the "waiting time" of ships outside the port for berths is important. The reasons for waiting time may be non-availability of suitable berths, lack of tugs or pilots, or tidal or weather constraints. It is essential to collect the data on each of the factors that contribute to the waiting time of ships in order to take corrective action. The "waiting time" of ships outside the port can be collected either in terms of days or in hours.

After the ships have been berthed, it is possible that stevedoring gangs may not be allocated or that, even if the gangs are allocated, stevedoring operations may not take place for some reason or other, so it is necessary to measure statistically the magnitude of the "idle time" of ships inside the port. Even if the stevedoring operations have commenced, it is possible that they may be affected by factors beyond the control of the port authorities, such as break down of the equipment or weather constraints. Therefore, apart from the computation of the turn-round time by showing the break-up of waiting time outside the port, idle and working time inside the port and the total time (from waiting time until completion of stevedoring operations), it is necessary to analyse statistically the duration of waiting time both outside and inside the port according to various causes.

The collection of data on the "working time" of ships will not pose any problem as they can be extracted from the daily record of the working of ships where the time of commencement and completion of stevedoring operations are normally entered. The waiting time and working time, if added, will give the total period of stay per ship and this will be the turn-round time of vessels computed either in terms of hours or days.

After having computed the turn-round time of the vessel, it will be useful to compute the productivity per ship working-hour or ship working-day, ship-hour in port or ship-day in port, and ship/day including the waiting time outside the port. The shipowners are interested only in getting the maximum output possible per ship-day or ship-hour. If the average output per ship-day is higher, then turn-round will be faster, and thereby the shipowner's cost of "staying time" in the port will be very much reduced. It is for this reason the various shipping conferences press the port authorities to take "effective steps" to increase the output per ship-day.

From the point of view of the port authorities, however, it is considered absolutely necessary to compile statistical information on the turn-round time of shipping, not only to improve the port operational efficiency but to have "fruitful negotiations" with the various shipping conferences serving the ports. In some ports, freight surcharges have been imposed by the conferences on grounds of slow turn-round of vessel. How far this assertion is correct is ascertainable only if the port authorities compile accurate statistical data on turn-round. If the statistical data show that turn-round time is improving, such data can be forwarded to the governmental authorities and to the shippers' councils to press for the removal of freight surcharges. Moreover, these statistics will be very useful in making it possible to have meaningful negotiations with conferences to prevent the imposition of freight surcharges or the increase of freight rates.

Compilation of turn-round according to various groupings

The compilation of turn-round according to various groupings is very useful for identifying peculiar problems affecting the turn-round time of a vessel handling a particular type of cargo. It is desirable to compile the turn-round time according to vessels belonging to the various conferences serving the ports in order to facilitate discussions with any particular conference on matters connected with freight or freight surcharges. Unless the port authorities compile the turn-round time according to the vessels belonging to the major shipping conference, it is not possible for the Government to enter into fruitful negotiations with that conference. Normally, the discussions between the conferences and the governmental authorities on freight or freight surcharges centre on the performance of the conference vessels, but no meaningful discussions of this kind can take place without adequate statistical information on turn-round time. Another important grouping of vessels for compilation of turn-round time is done on a cargo-wise basis. This is considered very useful from the port operational point of view, e.g. the turn-round time of a vessel which discharges 10,000 tons of general cargo will be longer than that of a vessel which discharges 10,000 tons of bagged cargo, the rate of unloading bagged cargo being faster. Unless the computation of turn-round time is done separately for bagged cargo, general cargo, bulk cargo etc, one will not get a correct picture. The compilation of turn-round time on a cargo-wise basis can be decided only by the port authorities according to the type of traffic taking place in the ports.

Another subdivision from the main cargo-wise groupings is the compilation according to classes of cargo volume, e.g. (a) 0 - 1,000 tons, (b) 1,001 - 2,000 tons, (c) 2,001 - 3,000 tons, etc. The turn-round of a ship discharging 10,000 tons of cargo may be proportionately faster than that of one discharging 5,000 tons. All these statistical data, if compiled, will be very useful for the port authorities to effect improvements in the operations. In the port of Madras, the following groupings are used in compiling turn-round time: (a) tankers, (b) colliers,

(c) foodgrain carriers, (d) ore carriers, (e) fertilizer carriers, (f) vessels carrying other dry bulk cargo, (g) vessels carrying other liquid bulk cargo, (h) vessels carrying other general cargo. All the details necessary for the computation of turn-round are also being maintained by the port authorities. The port of Kelang also compiles information on turn-round, but there is scope for refinement as the compilation is not done according to groupings. In the port of Colombo, groupings are made according to (a) cargo, viz. [i] *general cargo*, [ii] *food cargo* [*rice, flour, sugar*], [iii] *bagged cargo*, [iv] *colliers*, [v] *loaders*, (b) vessels belonging to conferences, viz. *UK/Continental, USA, Japan for dischargers and for loaders*, and (c) cargo volumes. As a result information is available on the average tonnage handled per ship for each grouping, average number of days lost on account of non-availability of berths, average output per ship-day, average turn-round time, etc.

3. Indicators of berth throughput

The berths vary according to the type of handling equipment used for cargo operations. The major categories of berths are general cargo, passenger, oil, coal, grain, timber, roll-on/roll-off, container and mixed. The throughput per berth is defined as the total tonnage of cargo discharged from and loaded into all ships and lighters tied up alongside all the berths in the area or group divided by the number of berths in the area or group. For this purpose, the tonnage handled overside is also included. Normally, the throughput per berth is calculated on an annual basis. The volume of cargo handled at a given berth has no relationship with the level of operational efficiency maintained with regard to stevedoring and lighterage operations. For example, increased throughput per berth can also be obtained by maintaining the maximum berth occupancy rate with a maximum supply of stevedoring gangs required to operate all hatches of the ships continuously for all the shifts. This can be illustrated statistically by taking a hypothetical case. Suppose, at berth X, five stevedoring gangs were employed for three shifts and the total output for a day of 24 hours was 840 tons, the gang-hour productivity being assumed to be 8 tons. (Three working hours have been excluded as meal hours). Suppose, at berth Y, in another port where the labour supply is scarce, three stevedoring gangs were employed for each of the three shifts and the total output for a day of 24 hours was 945 tons, the stevedoring productivity rate being assumed to be 15 tons per gang-hour. In this instance, it is seen that throughput per berth. Y exceeded that of berth X because of the higher rate of productivity per gang-hour even though labour supply to meet the operational requirement is scarce. From this, it is observed that the throughput of a berth can be increased either by maintaining a higher rate of productivity or by employing a maximum number of labour gangs required for all three shifts of eight hours. The statistical data collected on throughput per berth will be useful for the formulation of the policy regarding the construction of berths to keep pace with the anticipated increase of traffic to be handled by a port.

4. Indicators of berth occupancy

The definition of this is the total number of hours that the berths were occupied by a ship divided by the total number of hours (24 hours a day) for a week or a month. It is only from the occupancy rate that one can gauge the actual utilization rate of a berth for the commercial operations of a port. It is quite possible for a port to function inefficiently with a high rate of berth occupancy, assuming that the stevedoring productivity is low. There may be some other ports with a high degree of stevedoring productivity that are also recording a high percentage of berth occupancy rates. If this situation prevails, the port has no alternative other than to construct additional berths. Very high rates of berth occupancy are not generally desired as repairs and dredging will then hardly be possible. It is essential to compute statistics on the berth occupancy for different types of berths so that the port management can take suitable measures to invest in additional berths if the rates are considered unduly high.

Method of computation of berth occupancy

The statistical section of the port authority should maintain a separate register showing the types of berths, such as general cargo, berths normally used for grain, iron ore etc. In this register, the number of ship-hours could be recorded according to each berth, e.g. for X berth, out of 744 hours in the month of January, the recorded ship-hours at berth were 550, and thus the berth occupancy was nearly 75 per cent. In order to obtain net occupancy rate, one should calculate the ratio of ship working hours at each berth to the number of working hours in a month.

5. Equipment utilization rate

The developing ports of the region are increasingly utilizing very expensive equipment for improving port operations to maintain speedy turn-round time of vessels. How far this equipment is being efficiently used, however, can only be assessed if accurate statistical data on the utilization rate is collected on a systematic basis. Unless the port authorities collect these statistical data on the performance of the port equipment, there will be no way of ensuring that capital equipment is being efficiently used. For this purpose, a detailed register may be maintained showing the types of equipment and their capacity. For each type of equipment, it is essential to record daily the number of hours used for cargo-handling operations. In the port of Madras, an attempt has been made to maintain the records of the traffic demand for each type of equipment on a daily basis, with the corresponding record of the supply, e.g. during 1973/74, out of 88 fork-lift trucks, the average traffic demand per day amounted to 66, and the supply was as high as 64.

In the port of Tanjung Priok (Jakarta), the average utilization rate for the equipment during 1974 was:

Fork-lift trucks — 34.6 per cent

Portal cranes — 37.9 per cent

Mobile cranes — 51.3 per cent

Floating cranes — 42.2 per cent

6. The cost of cargo handling per ton

The cost of cargo-handling operations influences not only the level of freight and freight surcharges but also the port tariff structure. When the port costs increase, the authorities have no alternative to increasing the level of port charges for handling operations. The shipowners normally do not bear the increase of handling charges (stevedoring and tallying) and therefore increase the freight rates applicable to the ports affected by the increase in handling charges. When the freight rates are increased, this affects the balance of payments to the extent of the increase in freight payments involved. Moreover, it affects the competitive position of the country's exports. In view of the importance of the impact of the increase in cargo-handling costs on the level of freight rates, it is essential that the port authorities collect the statistical information on various elements for cargo-handling operations. Compiling the information on this type of cost element can be done by the costing section. It is very important to remember that shipowners are only concerned about the increase in the *all-inclusive average payment per ton of cargo handled for stevedoring and tallying services*. There are also other elements of port costs, such as pilotage, berthing and bunkering charges, but these costs do not come within the purview of the cargo-handling operations. In some ports, the basic tonnage charge for stevedoring operations may be very low, but when the final bill is presented for settlement, the average payment per ton may be rather high. This is due to the fact that shipping agents have requested stevedores to work overtime, the cost of which is very high. When the overtime charge and the basic rate for cargo tonnage are added, the total amount payable by the steamer agents to the stevedoring authorities become high according to the shipping conferences. The ratio of basic charge to the total all-inclusive payment is also the reflection of the level of operational efficiency. It is necessary to compare these all-inclusive payments per ton statistically according to major types of cargo with developed ports of the different regions.

For port-to-port comparison, and also to ascertain the extent of the increase in payments by the steamer agents over the period of years for stevedoring operations, it is necessary for the statistical section to collect the information on a sampling basis. This should be done separately for loading and unloading major categories of cargo. The purpose of this exercise is to get a picture of the all-inclusive average payment per ton of cargo handled made by the steamer agents to the stevedoring authorities. Unless this picture is obtained, one cannot come to any conclusion that the cost to the shipowners for cargo-handling operations is increasing.

The statistical information on all-inclusive average payment for stevedoring operations can be compiled from the bills prepared by the stevedoring authorities. Normally, when the stevedoring operations are completed, the stevedoring authorities prepare a detailed bill showing

separately the relevant basic charge, the amount incurred for stevedoring operations performed during overtime hours, and other miscellaneous charges. From this bill, one can extract all the relevant particulars. One need not collect the information for all the vessels, but on a sampling basis. The total amount paid divided by the total amount of cargo handled will give the all-inclusive average payment made by the steamer agents.

The all-inclusive average payment per ton according to major categories can be compared with other ports in similar circumstances to gauge whether there is a significant difference. If the differences are rather high, it is a reflection on the operational efficiency of the port. In other words, if the stevedoring productivity either in terms of the output per ship-day or gang-hour is low, the

all-inclusive average payment of the steamer agents will be high. This is solely due to the fact that an inefficient stevedoring operation will result in low productivity standards and will therefore prolong the duration of the cargo-handling time of a given cargo tonnage. The longer duration will include several overtime hours, the cost of which will have to be borne by the steamer agents. When the final bill is presented by the stevedoring authorities for settlement by the steamer agents, the unit cost of handling a ton of cargo will naturally be high from their point of view. As a result of this, the shipowners reimburse themselves by increasing the freight rates. Therefore, considering the importance of these data, the port authorities should collect them on a systematic basis.

DAILY OUTPUT STATEMENT STEVEDORING (DISCHARGING)

Annex I

S.S. arrived at hrs. on

From Berth No: Ship started at on

Report at Hrs. on GANGS DAY MANIFESTED (Pkgs)

GANGS NIGHT QTY: (Tons)

Hatch No.	DAY OUT		No. of Men	NIGHT OUT		No. of Men	TOTAL OUT		PREVIOUSLY OUT		FULL TOTAL OUT		BALANCE	
	Packages	Tons		Packages	Tons		Packages	Tons	Packages	Tons	Packages	Tons	Packages	Tons
1														
2														
3														
4														
5														
6														
Total														

Boats completed Part boats alongside Numbers

Empties alongside Numbers

Completed time Completed time

LIGHTERS COMPLETED

LIGHTERS COMPLETED

Nos	Packages	Commodity	Nos	Packages	Commodity	Nos	Packages	Commodity	Nos	Packages	Commodity

Detentions exceeding 15 minutes should be recorded according to hatches mentioning the reasons

GUIDELINES FOR THE ESTABLISHMENT OF PORT OPERATIONAL PERFORMANCE INDICATORS

Annex II

Monthly Statistics on Stevedoring Productivity

DISCHARGING

Cargo Description	FIRST SHIFT								SECOND SHIFT								TOTAL								
	Quay I		Quay II		Stream		Total Quays		Quay I		Quay II		Stream		Total Quays		Quay I		Quay II		Stream		Total Quays		
	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	N.	G.	
A																									
B																									
C																									
D																									
E																									
F																									
G																									
H																									
I																									
Total																									

N = Net
G = Gross

INTERNATIONAL CONVENTIONS AND OTHER INSTRUMENTS FOR WHICH IMCO IS THE DEPOSITARY*

I. IMCO

Introduction

The inevitable risks to which ships are exposed at sea could lead to the loss of human life, ships and cargoes. In order to prevent such losses, therefore, it is necessary to ensure:

- (i) that the ship is adequately designed, constructed, equipped and maintained;
- (ii) that the cargo is properly loaded, handled and stowed;
- (iii) that the ship, machinery and equipment are operated safely; and
- (iv) that appropriate measures are taken in the case of an emergency.

With the rapid expansion of merchant fleets in the eighteenth century, the unsatisfactory state of ships and conditions on board led to the frequent occurrence of casualties to ships which caused serious concern to the public. This resulted in the introduction by Governments of legislation on maritime safety on the one hand and the development by classification societies of rules for the survey and classification of ships on the other. Because of the essentially international nature of maritime transport, efforts have long been made among maritime nations with the object of establishing internationally acceptable standards and practices in maritime safety.

Origin and development of IMCO

Following the Second World War and the establishment of the United Nations in 1945, the whole concept of international co-operation in the scientific, technical, industrial and transport fields was subjected to detailed study, and this led to the creation of specialized agencies of the United Nations.

The United Nations Maritime Conference was held in Geneva in 1948, and signed the Convention for the creation of the Inter-Governmental Maritime Consultative Organization (IMCO). It was not until ten years later, on 17 March 1958, that the conditions of coming into force of the IMCO Convention were fulfilled, thus enabling the First Assembly of IMCO to meet in London in January 1959.

The aim of IMCO is to provide machinery for co-operation among Governments in the field of governmental regulations and practices relating to technical matters of all kinds affecting shipping engaged in international trade, and to encourage the general adoption of the highest practicable standards in matters concerning maritime safety and efficiency in navigation, as well as the protection of the marine environment.

Membership

Membership of IMCO is open to all States Members of the United Nations and to other States in accordance with admission procedures contained in the Convention establishing it. The Secretary-General of the

United Nations is the depositary of this Convention. The Convention stipulates in Article 11 thereof that "No State or territory may become or remain a Member of the Organization contrary to a resolution of the General Assembly of the United Nations."

There are at present 87 full members of the organization and one associate member. Of this number, 19 are States from Africa, 22 are States from Asia, 15 are States from Latin America, 8 are States from eastern Europe and 23 are States from western Europe and others.

Main organs and bodies

The organization has three principal organs: the Assembly, the Council and the Maritime Safety Committee.

The Assembly is the supreme governing body of the organization. It determines the policy of the organization, decides upon the work programme and votes the budget to which members of the organization contribute according to a scale of assessment based in part on the United Nations scale of assessments and in part on the total tonnage of ships registered in each member State. The Assembly approves all financial regulations and elects the member States to serve on the Council and the Maritime Safety Committee. It also has the responsibility of approving the appointment of the Secretary-General of the organization. The Assembly is composed of all member States of the organization and normally meets once every two years.

The Council consists of eighteen member States elected for a term of two years at a time by the Assembly. Subject to the authority of the Assembly, it supervises the execution of the work programme of the organization and performs the functions of the governing body between sessions of the Assembly.

The Maritime Safety Committee consists of sixteen member States elected for a four-year term by the Assembly. It is responsible for the technical work of the organization, particularly concerning maritime safety and efficiency of navigation. It performs its functions mainly with the assistance of sub-committees and other subsidiary bodies which are generally open to participation by all States members of the organization.

In addition to these principal organs, there are a number of important subsidiary organs. These are described in the following paragraphs.

The Marine Environment Protection Committee is a permanent subsidiary organ of the Assembly whose membership is open to all member States of IMCO as well as States which are parties to the conventions in respect of which the Committee performs functions. It is responsible for administering and co-ordinating the activities of IMCO relating to the prevention and control of marine pollution from ships, vessels and other equipment operating in the marine environment.

The Legal Committee is a permanent subsidiary organ of the Council and is charged with the considera-

tion of legal matters of concern to the organization. The Legal Committee is open to participation by all member States of IMCO.

The Committee on Technical Co-operation is a subsidiary body of the Council and performs advisory functions in respect of IMCO's programme of technical assistance to developing countries. Membership of the Committee is open to all member States of IMCO.

The Facilitation Committee is a subsidiary body of the Council established to advise the Council on matters relating to the facilitation of maritime traffic. It also provides advice to the Secretary-General of the organization in relation to his functions under the International Convention for the Facilitation of Maritime Traffic, 1965. Membership of this Committee is open to all members of IMCO as well as to States Parties to the 1965 Convention.

Recent developments

The eighth regular session of the IMCO Assembly, which was held in November 1973, gave consideration to the size and composition of the Council and Maritime Safety Committee, particularly in view of the recent increase in the membership of IMCO and the increasing importance of IMCO's technical work to these new members, many of which are developing countries.

The fifth extraordinary session of the IMCO Assembly, which was held in October 1974, adopted amendments to the IMCO Convention,¹ i.e. to increase the membership of the Council from its present total of eighteen to twenty-four, and to make membership of the Maritime Safety Committee open to all member States of IMCO. These amendments have now been submitted to the member Governments of IMCO for acceptance.

The scope of IMCO's activities

Through the machinery outlined above, IMCO provides its member States with a forum for the exchange of information experience on all maritime matters falling within the scope of the objectives and functions enumerated in the IMCO Convention. The organization performs its functions *inter alia* by:

- (a) providing for the adoption of conventions or other instruments on those matters which are suitable for solution through formal international agreements;
- (b) Adopting recommendations, codes, standard practices and guidelines where appropriate;
- (c) Initiating studies on particular problems and making the results of such studies available to interested States.

The extensive range of activities undertaken by IMCO may be grouped under three broad category headings. These are:

- (a) Activities relating to the promotion of maritime safety and efficiency of navigation;
- (b) Work relating to the prevention and control of marine pollution from ships and other

craft and related questions;

- (c) Other work relating to shipping and related maritime activities, including in particular technical assistance to developing countries.

The various aspects of the organization's work are, of course, inter related. Thus, for example, the work in relation to maritime safety and efficiency is, in a very important sense, part of the "environmental" programme of IMCO, since, by ensuring the highest standards of safety, it serves to eliminate or at least reduce to a minimum such incidents as collisions and stranding, which are likely to result in the discharge into the sea of harmful cargoes. Such accidental discharges are of course a major source of marine pollution from ships and other craft. Similarly, the efforts to prevent pollution of the seas from ships demand, and have promoted, the development of equipment, procedures and facilities which increase efficiency of navigation.

IMCO is the depository of a number of conventions and other instruments which have either been adopted under the auspices of the organization or entrusted to it for administration. These conventions are constantly reviewed and amended from time to time in the light of technological advances and experience. The organization has also adopted a large body of recommendations, codes of practice and other guidelines which have been submitted to States for adoption and implementation as appropriate.

Those conventions and other similar instruments, as well as some of the codes of practice are summarized in the following chapters.

II. INTERNATIONAL INSTRUMENTS MAINLY RELATED TO MARITIME SAFETY AND EFFICIENCY OF NAVIGATION

International Convention for the Safety of life at Sea, 1960.

Following the tragic loss of the passenger ship "Titanic" in 1912, the United Kingdom Government convened an international conference on safety of life at sea in 1913/14. The Conference resulted in the adoption of the International Convention for the Safety of Life at Sea, which, however, did not come into force because of the outbreak of the First World War. A fresh start was made by a new Conference in 1929, which produced the first effective Convention for the Safety of Life at Sea. The Convention was subsequently reviewed and revised by international conferences in 1948 and 1960. The 1960 Convention, which is currently in force, is accepted by 89 States.

The 1960 Safety Convention deals with various aspects of maritime safety and contains provisions in respect of:

- construction of ships, including subdivision, stability, machinery and electrical installation, and fire protection and extinction;
- life-saving appliances;
- radio-communications, including radiotelegraphy and radiotelephony;
- safety of navigation;
- carriage of grain;

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- carriage of dangerous goods;
- nuclear ships;
- survey and certificates.

The Safety Convention applies to all merchant ships engaged on international voyages, which include passenger ships (ships carrying more than twelve passengers) of all sizes and cargo ships of 500 tons gross tonnage and upwards, but exclude fishing vessels, pleasure yachts, barges and ships solely navigating the Great Lakes and the River St. Lawrence. The provisions of the Convention are briefly as follows:

[a] *Subdivision and damage stability*

The subdivision of ships means the division of the hull into a number of watertight compartments in order to ensure that, after damage to one or more compartments under certain conditions, the ship remains afloat and stable. Passenger ships are required to withstand the flooding of one, two or three compartments dependent upon the length of the ship and number of passengers on board. Ships should also comply with certain provision for the position of bulkheads, doors in bulkheads and other openings in ship's sides, pumping arrangements, etc. Ships for which the subdivision and damage stability is calculated in accordance with the Convention are assigned with subdivision load lines marked on the ship's sides at amidships.

[b] *Intact stability*

Stability is the capability of ships to return to the upright position when inclined. Small ships, in particular small fishing vessels, are more liable to suffer from insufficient stability and therefore require careful attention. The Convention does not set out specific requirements for the stability, but the Recommendations on Intact Stability adopted by IMCO provide for stability criteria which are judged by metacentric height and righting arm curves calculated for different loading conditions. In passenger ships, the heeling moments due to crowding of passengers and ship turning are taken into account.

[c] *Fire protection*

Fire is one of the most serious hazards in ships, particularly passenger ships, tankers and other ships carrying inflammable cargo. The regulations for fire protection in passenger ships prescribe the provisions of steel decks, superstructures and deckhouses, the separation of accommodation spaces from machinery and cargo spaces, the protection of control stations, stairways and lifts, the fitting of fire-resisting bulkheads and decks, restricted use of combustible materials, installation of fixed fire detecting and extinguishing systems, fire hoses and portable extinguishers in accommodation, machinery and cargo spaces, means of escape, fire drills and emergency procedures, etc. Similar, but less stringent, provisions are made for cargo ships of 4,000 tons gross tonnage and upwards. Bulkheads, deck coverings, paints

and fire-extinguishing equipment should be tested and approved by the Administration.

Serious fire casualties which have occurred to passenger ships prompted the organization to give urgent consideration to fire safety of passenger ships, and regulations of the Convention were extensively amended in 1966 and 1967 to provide improved fire safety both for existing and future passenger ships, based on the principle of dividing a ship into main vertical zones and detection, containment and extinction of the fire in the zone of origin. Furthermore, recommendations on fire safety regulations for the construction and equipment of new tankers have been formulated; those for general cargo ships and fishing vessels are under way.

[d] *Safety equipment*

The Convention prescribes the number, specification and arrangement of lifeboats, boat davits, life-rafts (rigid and inflatable), life-jackets, lifebuoys and line-throwing appliances. The equipment of lifeboats and life-rafts is also specified.

The recent amendments to the Convention prescribe the compulsory carriage of radar, echo sounders and gyrocompasses for ships of over a certain size, as well as up-to-date nautical publications and the International Code of Signals.

The requirements for navigational lights and sound signals are covered by the Regulations for Preventing Collisions at Sea.

[e] *Safety of navigation*

Among the requirements of the Convention, except for the compulsory carriage of navigational aids referred to above, two provisions significant to safety to navigation are worth mentioning, viz. the principle of following recognized routes in areas of converging or dense traffic and the obligation of Contracting Governments for establishing, operating and maintaining search and rescue facilities.

[f] *Ship's routing*

The practice of following predetermined routes originated in 1898 and was adopted, for reasons of safety, by shipping companies operating passenger ships across the North Atlantic. It was subsequently incorporated into the Safety Conventions, including the 1960 Convention. The increase in traffic density, combined with the use of ships of greater tonnage and higher speed, indicated that the wider application of the principle of traffic separation, wherever it was warranted, could contribute substantially to safety at sea by reducing the number of ships meeting on opposite or nearly opposite courses and by providing an orderly flow of traffic. In view of this, the IMCO Assembly, by resolution A. 205 (VII) has invited all Governments concerned to accept an amendment to chapter V of the 1960 Safety Convention which, *inter alia*, recognize IMCO as the only international body responsible for establishing and adopting measures on an international level concerning ship's

routing, and areas to be avoided by ships or a certain class of ship.

Up to the present, nearly 100 schemes have been adopted by IMCO and recommended to Governments for observance. These schemes are located all over the world. As experience is gained, and in line with the expansion of maritime traffic, these schemes are amended and new schemes are added. National hydrographic services have been advised that the details of schemes, as adopted by IMCO, should be represented on charts and should also be given in Sailing Directions. Member Governments of IMCO are informed of new schemes and amendments so that all details of the schemes are promulgated in Notices to Mariners, together with dates of implementation.

[ii] *Search and rescue*

The provision of search and rescue facilities depends primarily on the initiative and resources of each member Government. However, the Maritime Safety Committee recognized the importance of standardized methods, procedures and organization arrangements intended to determine areas of responsibility and to achieve better co-ordination of search and rescue services. It prepared in 1970 the "Merchant Ship Search and Rescue Manual (MERSAR)" for the purpose of providing guidance for those who, during an emergency at sea, may require assistance or who may be able to render such assistance. In particular, it was designed to help the master of any vessel who might be called upon to conduct search and rescue operations.

At present a Group of Experts on SAR is preparing an international instrument. This future convention will be composed of the convention proper and a technical annex which stipulates operational and technical requirements. The Group agreed to prepare a manual expanding and explaining SAR requirements laid down in the technical annex of the convention for the guidance of Administrations in establishing Search and Rescue Organizations in their areas of responsibility. This manual, together with the existing Merchant Ship Search and Rescue Manual will be the two main supporting documents for the technical annex.

[j] *Radio-communications*

The Convention prescribes that passenger ships of all sizes and cargo ships of 1,600 tons gross tonnage and upwards shall be fitted with radiotelegraph stations. Cargo ships of less than 1,600 tons but not less than 300 tons gross tonnage should be fitted with either a radiotelegraph or a radiotelephone station. The Convention also prescribes watches to be maintained. These radiotelegraph or radiotelephone stations should comply with certain technical requirements. Frequencies of transmitters are determined in accordance with the Radio Regulations of the International Telecommunication Convention. Radiotelegraph installations in motor lifeboats should also comply with the requirements of the Safety Convention and Radio Regulations.

In addition to radiotelegraph and radiotelephone, the use of VHF radiotelephone was recognized, and an amendment relating to technical and other requirements for the use of VHF radiotelephone was adopted.

[g] *Carriage of bulk cargoes, including grain*

Ships carrying grain in bulk should maintain sufficient stability to withstand the heeling moment due to shift of grain during the voyage. Regulations for the bulk carriage of grain prescribe the stability criteria of ships, the maximum assumed heeling angle due to shift of grain, strength of grain fitting and the method of loading. In ships carrying ore and ore concentrates liable to become fluid during transportation, precautions should be taken to avoid the loss of stability due to free water effect of the cargo. The Code of Safe Practice on the carriage of bulk cargo other than grain, formulated by IMCO in amplification of the Convention, provides information for the safe distribution of weight in the cargo holds, on the hazards pertaining to particular types of cargoes and recommended methods for determining cargo properties, etc.

[h] *Carriage of dangerous goods*

The carriage of dangerous goods in packaged form is regulated, in general, by the provision of the Convention which accepted the classification of dangerous goods agreed by the relevant United Nations Committee of Experts. To supplement the provisions of the 1960 Safety Convention, IMCO has developed an International Maritime Dangerous Goods Code. The Code covers all dangerous substances which may be carried on board as cargo, and contains descriptions of the physical and chemical properties of each substance, together with recommendations for packaging, marking, labelling, segregation and stowage. It also incorporates precautionary measures to be taken when carrying these substances and instructions on what should be done in the case of damage to the receptacle, outbreak of fire, etc.

There has been a remarkable increase in recent years in the carriage of dangerous chemicals in bulk. Although the Convention does not cover the bulk carriage of such cargo, in order to ensure its safe carriage, IMCO has developed a Code for the Construction, Equipment and Operation of Ships Carrying Dangerous Chemicals in Bulk. The Code provides suitable design criteria, construction standards and other measures for transporting dangerous chemical substances in bulk so as to minimize the risk to the ship, its crew and the neighbourhood with respect to fire, health, water pollution, air pollution and reactivity hazard. A similar Code dealing with liquefied gases has been developed, and the IMCO Assembly is expected to adopt the Code in November this year.

[i] *Survey and certificates*

The Convention lays down detailed requirements for inspection and survey of the structure, machinery, equipment, life-saving appliances, radio-installation, etc., before the ship is put into service and periodically

thereafter by the officers of the flag State or organization recognized by the Government. After a satisfactory survey, the relevant internationally recognized certificate will be issued and all certificates or their certified copies are to be posted up in a prominent and accessible place in the ship.

Every ship is subject, in ports of other Contracting Governments, to control by officers concerned for the enforcement of the Convention. Usually this control is directed towards verifying that there is a valid certificate on board. If, however, there were clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificate, the officer is obliged to take steps to stop the ship from sailing until it can proceed to sea without danger to the passengers or crew.

International Convention for the Safety of Life at Sea, 1974

As mentioned above, various amendments to the 1960 Safety Convention have been adopted by the IMCO Assembly in 1966, 1967, 1968, 1969, 1971 and 1973. However, none of these amendments has so far entered into force. This may be partly because a large number of acceptances is required for an amendment to enter into force, i.e. two thirds of 89 Contracting Governments who must, in turn, establish national legislation before an amendment can be ratified, which in many cases is a time-consuming process.

Noting the above fact with concern, the IMCO Assembly decided to convene an international conference in 1974. The Conference achieved its objectives given by the IMCO Assembly by adopting a new Safety Convention, the technical regions of which are substantially in conformity with those of the 1960 Safety Convention, and which incorporates all the amendments so far adopted by the Assembly. The new Convention also provides for an improved and accelerated amendment procedure by which amendments on technical regulations can be adopted by the Maritime Safety Committee with the participation of Contracting Governments, whether or not members of IMCO, and deemed to have been accepted after a specified period, unless expressly objected to by more than one third of the Contracting Governments or by Contracting Governments whose combined merchant fleets constitute not less than 50 per cent of the gross tonnage of the world merchant fleet.

The 1974 Safety Convention will enter into force twelve months after the date on which not less than 25 States, whose combined merchant fleets constitute not less than 50 per cent of the gross tonnage of the world merchant fleet, have accepted the Convention.

International Convention on Load Lines, 1966

Overloading is often the cause of casualties to ships, particularly cargo ships. In 1930, only a year after the first effective safety conference, a further international conference produced a convention on load lines. This Convention lasted for 36 years until it was replaced

by a new Convention draw up by an international conference convened by IMCO in 1966.

The 1966 Load Line Convention prescribes the minimum freeboard (or the maximum draught) to which the ship is permitted to be loaded. The Convention applies to all merchant ships engaged on international voyages, except ships of less than 24 metres in length, fishing vessels, pleasure yachts and ships solely navigating the Great Lakes, the St. Lawrence River, the Caspian Sea and the Plate, Parana and Uruguay Rivers. At present, 74 countries have accepted the Convention.

The position of the load lines is determined on the basis of the ship's length, proportions, form, the length of superstructures. For certain ships, such as large tankers and bulk carriers, the load line is conditional upon the degree of subdivision and damage stability. To enable a ship to be assigned with the minimum freeboard, it should comply with certain conditions in respect of the strength of ships, closing appliances of openings in the ship's hull and superstructures, guard rails, freeing ports, means of access to crew's quarters as well as stowage of timber deck cargo when timber load lines are assigned.

The load line mark shown on the ship's sides consists of several lines for different zones and seasonal areas, i.e. Tropical Fresh Water, Fresh Water, Tropical, Summer, Winter and Winter North Atlantic Load Lines. For ships assigned with timber load lines, additional lines for the carriage of timber are marked. The zones and seasonal areas are defined in the Convention.

International Convention on Safe Containers, 1972

IMCO has spent a number of years working on the technical and safety aspects of containerization. In 1972, IMCO co-sponsored with the United Nations the UN/IMCO Conference on International Container Traffic. One of the instruments adopted by this Conference is the International Convention on Safe Containers, 1972. This Convention has been accepted by 6 States and needs a further 4 acceptances before it enters into force.

The Convention sets out the minimum technical requirements for containers and their strength and construction, and in particular test loads and test procedures and methods to ensure safety in handling, stacking and transporting of containers. It also provides for design type-testing and certification intended to facilitate the movement of containers, including internationally recognized plates, their contents and methods of display.

International Regulations for Preventing Collisions at Sea, 1960 and 1972

The International Regulations for Preventing Collisions at Sea, 1960 sets out basic rules which regulate the behaviour of vessels at sea in respect of other vessels in order to prevent collisions, and deals with such matters as:

- lights and shapes
- sound signals and conduct in restricted visibility

- steering and sailing rules
- sound signals for vessels in sight of one another.

The Regulations developed in 1960 took account of the technological knowledge at that time. In view of significant changes in the size and speed of vessels, the introduction of new types of craft in the marine environment and the experience gained from the application of the existing Regulations, a need arose to consider comprehensive revision of the Regulations.

A conference convened by IMCO in October 1972 concluded a new Convention on the International Regulations for Preventing Collisions at Sea to replace the 1960 Regulations at present in force. The revised Regulations take account of current technical developments and constitute a significant improvement on the existing Rules. They prescribe in a comprehensive way the manoeuvring procedures and actions to be taken by ships under various circumstances for the purpose of avoiding collisions, with reference to the need for avoiding hampering the safe passage of vessels restricted in their ability to manoeuvre due to their draught.

Special Trade Passenger Ships Agreement, 1971

In October 1971, IMCO convened a conference to consider a number of questions regarding the safety of ships carrying large numbers of unberthed passengers in special trades, such as the pilgrim trade which is of particular interest to certain developing countries. Until then, the carriage of passengers by this mode of transport was regulated by the Simla Rules of 1931 which had steadily become out of date. The 1971 Conference adopted the Special Trade Passenger Ships Agreement. The Agreement modifies the requirements of the 1960 Safety Convention, in particular Chapters II (Construction) and III (Life-Saving Appliances), in a form of general rules applicable to the special circumstances of the trade. This Agreement entered into force in January 1974.

Protocol on Space Requirements for Special Trade Passenger Ships, 1973

The 1971 Conference recognized that the formulation of general rules concerning the space requirements of passengers on special trade passenger ships has direct bearing on the safe carriage of such passengers, and, pursuant to a recommendation of the Conference, an international conference was convened in 1973 to adopt a Protocol on Space Requirements for Special Trade Passenger Ships, 1973. Annexed to this Protocol, which is complementary to the 1971 Special Trade Passenger Ship Agreement, are the technical rules covering the safety aspects of the disposition of passengers in special trade passenger ships. The Rules provide, *inter alia*, minimum space allocation per passenger depending on the duration of the voyage and the location on board a ship.

III. INTERNATIONAL INSTRUMENTS MAINLY RELATED TO PREVENTION AND CONTROL OF MARINE POLLUTION FROM SHIPS

International Convention for the Prevention of Pollution of the Sea by Oil, 1954 as amended in 1962

The first major step towards the international control of marine pollution was taken in 1954 when a conference held in London adopted the International Convention for the Prevention of Pollution of the Sea by oil. The Convention was provisionally deposited with the United Kingdom Government until IMCO was established in 1959 when the depositary functions were taken over by the organization. The principal object of the 1954 Convention was the protection of the seas from oil pollution, which was achieved by prescribing certain "prohibited zones" extending to at least 50 miles from the nearest land, within which the discharge of oil or oily mixtures (containing 100 parts of oil per million parts of mixture or more) was prohibited.

In 1962, IMCO convened a Conference which adopted amendments to the 1954 Convention, particularly by extending its application to include ships of lesser gross tonnage and by extending zones in which the discharge of oil was prohibited.

The Convention also requires every ship to carry on board an oil record book of specified form and to record such operations as ballasting, deballasting and cleaning of cargo and fuel oil tanks, discharge of oily residues etc., as well as accidental or other discharges or escapes of oil together with a statement on the circumstances of and reasons for such discharge or escape. It also provides for the inspection of the oil record book by the officials concerned with controlling the observance of the Convention. If a provision of the Convention is contravened by a ship, any Contracting Government may furnish the Contracting Government of the Flag State of that ship with evidence of the Contravention in writing. The Government receiving such information is obliged, if satisfied that sufficient evidence is available to take legal proceedings against the master or owner of the ship, to take action and to inform IMCO and the reporting Government of the result of such proceedings. A revised Article on Amendments was adopted under which the IMCO Assembly is empowered, on the recommendation of the Maritime Safety Committee, to adopt amendments to the Convention and submit them to Contracting Governments for their acceptance. The 1954 Convention, as amended in 1962, has been accepted by 51 States and has been in force since May 1967.

In 1969, the IMCO Assembly adopted further extensive amendments which, apart from certain practical exemptions, prohibit oil discharge through the normal operation of a ship. When they enter into force the restrictions to be applied will include:

- (i) limitation of the total quantity of oil which a tanker may discharge in any ballast voyage to 1/15,000 of the total cargo carrying capacity of the vessel;
- (ii) limitation of the rate at which oil may be discharged to a maximum of 60 litres per mile

- travelled by the ship, and
- (iii) prohibition of discharge of any oil whatsoever from the cargo spaces of a tanker within 50 miles of the nearest land.

The 1969 amendments will also provide for a new form of oil record book which is designed to show the movement of cargo oil and its residues from loading to discharging on a tank-to-tank basis. When they enter into force, these amendments should considerably reduce the over-all total quantity of oil discharged into the sea and achieve significant progress towards the ultimate goal of complete avoidance of discharge of oil.

In 1971, the IMCO Assembly again adopted two further amendments to the Convention. One of the amendments is aimed at providing special protection for the Great Barrier Reef area, in view of its unique scientific and environmental significance, by regarding the area as if it were a part of the land. The other one concerns tank arrangement and limitation of the size of an individual tank of a tanker, aimed at minimizing the amount of oil which could escape as a result of maritime accidents, particularly those involving very large tankers.

It may be useful to look into the background of the latter amendment. The demand for ships to carry continuously increasing quantities of oil^{1/} has led not only to an increase in the number of vessels so employed but also to a very substantial increase in the size of individual tankers.^{2/} Whereas in 1948 a tanker of 26,000 tons was the largest of this type of ship, by the end of 1970 over 100 tankers exceeding 100,000 tons deadweight were in service. When the tank size limitation amendments were under consideration, a tanker of 500,000 tons deadweight was on order and it was forecasted that 1,000,000 tonners would come into service by the end of the decade.^{3/}

Up to 1971, the size of individual tanks in tankers had been limited by strength considerations, which might permit the design of a million ton tanker with individual tanks as large as or exceeding the total capacity of the "Torrey Canyon". The magnitude of the pollution which might arise from a ship of these dimensions, if involved in an accident, led the organization to take measures. Based on the result of an intensive study by an IMCO technical body, which included consideration of tank design and distribution and of the cost and other consequences of tank size limitation, requirements were formulated setting out a limitation of hypothetical outflow of oil in the event of collision or stranding of oil tankers to a value of 30,000 m³. The implications of this oil outflow limitation will vary according to various

1/ In 1973, 1,695 million tons of oil were exported/imported, which, when compared with the 1963 figure of 615 million tons, shows an annual increase of 10.8 per cent.

2/ In 1963, the world tanker fleet consisted of 5,130 tankers with 50 million tons gross tonnage. It had grown to 6,875 tankers with 130 million tons gross tonnage in 1973.

3/ The recent oil crisis may have affected the situation. However, about 300 tankers exceeding 200,000 tons deadweight are at present in service, and, as of 31 October 1974, according to 'Fairplay', 516 tankers of more than 150,000 tons averaging 289,106 tons deadweight were on order or being negotiated, all for delivery within a few years. This order book includes 80 VLCCs of more than 400,000 tons and a 700,000 tonner.

factors, such as arrangements of tanks, the fitting of double bottoms and the interposing of clean water ballast tanks, but, in the case of a normal single hull tanker with two longitudinal bulkheads, the capacity of a single centre tank and a wing tank will be limited to 30,000 m³ and 15,000 m³ respectively.

Although these 1969 and 1971 amendments have not formally entered into force, it has been recommended that they be put into effect nationally and they are observed in many countries.

International Convention for the Prevention of Pollution from Ships, 1973

Notwithstanding the foregoing action by IMCO to deal with oil pollution, far-reaching developments in modern industrial practices have introduced the need for further action on a much larger scale and considerably broader in scope than has been required hitherto. This situation was recognized by the IMCO Assembly when, in 1969, it decided to convene an international conference for the purpose of preparing a suitable international agreement for placing restraints on the contamination of the sea, land and air by ships, vessels and other equipment operating in the marine environment.

The international conference, which met in London in October 1973, adopted a new International Convention for the Prevention of Pollution from Ships, 1973 to replace the 1954 Oil Pollution Convention.

The new Convention covers all aspects of pollution from ships, except disposal of waste into the sea by dumping. It applies to ships of all types, including hydrofoil boats, air-cushion vehicles, submersibles, floating craft, and fixed or floating platforms operating in the marine environment. The Convention does not, however, apply to pollution directly arising out of the exploration and exploitation of sea-bed mineral resources.

The Convention consists of articles, two protocols dealing respectively with reports on incidents involving harmful substances and arbitration, and five annexes which contain regulations for the preventions of:-

- (a) Pollution of oil;
- (b) Pollution by noxious liquid substances carried in bulk;
- (c) Pollution by harmful substances other than those carried in bulk;
- (d) Pollution by sewage from ships;
- (e) Pollution by garbage from ships.

The main provisions of the 1973 Convention, supplemented as appropriate by the related decisions of the Conference, are summarized in the following paragraphs.

[a] Prevention of pollution by oil (Annex I)

The Convention maintains the oil discharge criteria prescribed in the 1969 amendments to the 1954 Oil Pollution Convention, without substantial changes, except that the maximum quantity of oil which is permitted to be discharged in a ballast voyage of new oil tankers has been reduced from 1/15,000 to 1/30,000 of the amount of cargo carried. These criteria apply equally to both persistent (black) and non-persistent (white) oils. A new

and important feature of the 1973 Convention is the concept of "special areas". Specified areas considered to be particularly vulnerable to pollution by oil have been designated as 'special areas' in which oil discharges have been completely prohibited, with minor and well-defined exceptions. The main special areas in the Convention are the Mediterranean Sea Area, the Black Sea Area, the Baltic Sea Area, the Red Sea Area and the 'Gulfs' Area.

All oil-carrying ships will be required to be capable of operating with the method of retention on board in association with the "load-on-top" system or discharge to reception facilities. To effect this, all new and existing oil tankers and other ships will, with certain exceptions, be required to be fitted with appropriate equipment, which will include an oil discharge monitoring and control system, oily water separating equipment or filtering system, slop tanks, sludge tanks, piping and pumping arrangements.

With regard to the constructional aspects of oil tankers, two important provisions have been incorporated in the 1973 Convention. Firstly, new oil tankers, i.e. those for which the building contract is placed after 31 December 1975, of 70,000 tons deadweight and above, will be required to be fitted with segregated ballast tanks sufficient in capacity to provide adequate operating draught without a need to carry ballast water in cargo oil tanks. This requirement does not, however, call for the fitting of double bottom tanks. Secondly, new oil tankers will be required to meet subdivision and damage stability requirements so that they can survive after collision or stranding damage in any loading conditions.

[b] *Control of pollution by noxious liquid substances* (Annex II)

The Convention sets out detailed requirements for the discharge criteria and measures for control of pollution by noxious liquid substances carried in bulk. For this purpose, noxious liquid substances are divided into four categories depending upon their hazard to marine resources, human health, amenities and other legitimate uses of the sea. Some 250 substances have been evaluated and included in the list appended to the Convention. The discharge of residues containing such substances is allowed only either to reception facilities or into the sea provided that certain conditions which vary with the category of substances are complied with. In any case, no discharge of residues containing noxious substances is permitted within 12 miles from the nearest land. The Baltic Sea Area and Black Sea Area are designated as special areas in which stricter restrictions are applied for discharge of noxious liquid substances.

[c] *Prevention of pollution by harmful substances carried in packaged form, or in freight containers or portable tanks or road and rail tank wagons* (Annex III)

The Convention contains general requirements relating to the prevention of pollution by harmful substances carried by sea in packaged form or in freight containers, portable tanks or road and rail tank wagons.

Detailed requirements on packaging, marking and labelling documentation, stowage, quantity limitations and other aspects aimed at preventing or minimizing pollution of the marine environment by such substances will be developed in the future within the framework of the International Maritime Dangerous Goods Code or in other appropriate form.

[d] *Prevention of pollution by sewage and garbage* (Annexes IV and V)

Ships will not be permitted to discharge sewage within 4 miles from the nearest land unless they have in operation an approved treatment plant; between 4 and 12 miles from land, sewage must be comminuted and disinfected before discharge.

As regards garbage, specific minimum distances from land have been set for the disposal of all the principal kinds of garbage. The disposal of all plastics is prohibited.

[e] *Violation* (Article 4)

Any violation of the Convention, such as the unlawful discharge of harmful substances or non-compliance with the Convention requirements in respect of the construction and equipment of a ship, wherever such violation occurs, will be punishable under the law of the flag State. Any violation of the Convention within the jurisdiction of any Party to the Convention shall be punishable either under the law of that Party or under the law of the flag State. In this respect, the term "jurisdiction" in the Convention should be construed in the light of international law in force at the time of application or interpretation of the present Convention.

[f] *Inspection of Ships* (Article 5)

With the exception of very small ships, ships engaged on international voyages are required to carry on board valid International Certificates required by the Convention. Such certificates may be accepted at foreign ports as a *prima facie* evidence that the ship complies with the requirements of the Convention. If, however, there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificate, or if the ship does not carry a valid certificate, the authorities carrying out the inspection may detain the ship until they satisfy themselves that the ship can proceed to sea without presenting unreasonable threat of harm to the marine environment.

International Convention Relating to Intervention on the High Seas in case of Oil Pollution Casualties, 1969

The "Torrey Canyon" disaster of 1967 revealed certain shortcomings in the public international law regime regarding activities on the high seas which pose

the threat of pollution to the interests of States. In particular, questions were raised as to the extent to which a coastal State could take measures to protect its coastline where a casualty on the high seas threatened that State with oil pollution, especially if the measures involved are likely to affect the interests of foreign shipowners, cargo-owners and even flag States. The general consensus was that there was need for a new regime which, while recognizing the need for some State intervention on the high seas in cases of grave emergency, clearly restricted the right of intervention and stipulated the conditions under which, and the procedures through which, such intervention could be exercised.

Draft articles on these questions were prepared by the Legal Committee and these were considered by a diplomatic conference convened in Brussels in 1969. The Conference adopted the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969. This Convention affirms the right of a coastal State to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate danger to its coastline or related interests from pollution by oil or the threat thereof, following upon a maritime casualty. The coastal State is, however, empowered to take only such action as is necessary and proportionate in the light of the pollution or threat thereof, and after, if time permits, due consultations with appropriate interests, including, in particular, the flag State or States of the ship or ships involved, the owners of the ships or cargoes in question and, where circumstances permit, independent experts chosen from a list prepared and maintained by IMCO. A coastal State which takes measures beyond those permitted under the Convention is liable to pay compensation for any damage caused by such measures. The Convention contains provisions for the settlement of disputes through negotiation, conciliation or arbitration.

The Convention has been accepted by 15 States, satisfying the requirement for entry into force, and will enter into force on 6 May 1975.

Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances other than Oil, 1973

In view of the increasing quantity of chemical substances carried by ships, some of which would, if released through a maritime casualty, cause serious hazard to the marine environment, the 1969 Brussels Conference recognized the need to extend the Intervention Convention to cover substances other than oil. The Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances other than Oil, 1973 was also concluded by the 1973 Marine Pollution Conference. The Protocol extends the regime of the 1969 Intervention Convention to those substances which are either listed in the Annex to the Protocol or which are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

International Convention on Civil Liability for Oil Pollution Damage, 1969

The other major legal issue brought to light by the "Torrey Canyon" incident was the nature, extent and amount of the ship and cargo owner's liability for damage caused to the third parties by oil which has escaped or been discharged from a ship as a result of an incident. This mainly "private law" problem was also taken up by the IMCO Legal Committee. The result of its study was submitted to the Brussels Conference of 1969 and adopted as the International Convention on Civil Liability for Oil Pollution Damage, 1969.

Under the Convention, strict liability is placed on the owner of the ship transporting the oil for the damage caused to the territory (including territorial waters) of a Contracting State, and for the cost of measures taken to prevent or to minimize such damage. The liability of the shipowner is limited in respect of each incident. This limitation is based on the net tonnage of the ship, i.e. 2,000 francs for each ton of the ship, with a ceiling of 210 million francs. The owner of a ship registered in a Contracting State and carrying more than 2,000 tons of oil in bulk as cargo is required to maintain insurance or some other acceptable guarantee to cover his liability. A certificate attesting this insurance or other financial security is required to be carried on board the ship. The Convention contains provisions determining the courts which have jurisdiction in cases where pollution damage occurs in more than one State, and provisions relating to the recognition and enforcement of the judgement of a competent court in the other Contracting States.

This Convention is not yet in force.

International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971.

The 1969 Liability Convention does not afford full protection for victims in all cases of oil pollution damage, while imposing a financial burden on shipowners, and, for this reason, the Brussels Conference (1969) recommended that some form of supplementary scheme, in the nature of an international fund to be subscribed by the cargo interests, should be established to ensure adequate compensation for victims of large-scale oil pollution incidents, and to relieve the burden placed on the shipowners. In accordance with the recommendation, an international conference was convened again in Brussels in 1971 and adopted the International Convention on the establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 for acceptance by the Contracting States of the Liability Convention.

The Fund Convention extends the limit of liability to 450 million francs. At the same time it indemnifies the shipowners for that portion of the aggregate amount of liability under the Liability Convention in excess of 1,500 francs for each ton of the ship's tonnage, or of an amount of 125 million francs, whichever is less, under certain conditions. In order to qualify for indemnification, for example, the ship has to comply with SOLAS,

the Collision Regulations, the Load Line Convention and the Oil Pollution Convention in force.

The Fund will be financed through contributions made in respect of each Contracting State by persons who have imported oil by sea in excess of 150,000 tons in the previous calendar year at a rate to be fixed by the Assembly of the Fund.

Internal regulations of the Fund have now been developed by the Legal Committee of IMCO for consideration and adoption by the first Assembly of the Fund.

IV. OTHER INTERNATIONAL INSTRUMENTS

International Convention on Tonnage Measurement of Ships, 1969

Tonnage consists of gross tonnage and net tonnage and is expressed by "registered ton", one ton being the volume equal to 100 cubic feet or 2.83 cubic metres. The gross tonnage is the internal volume of all spaces in a ship except certain spaces which are exempted. It is intended to represent the size of the ship. The net tonnage is intended to represent the volume of the ship's earning spaces, and is obtained by the deduction from gross tonnage of certain spaces not directly connected with the carriage of passenger or cargo. Tonnage is used for various purposes, such as application of conventions and regulations, collection of taxes and dues, and statistics.

The unification of systems for tonnage measurement of ships had been a great concern among maritime countries for a long time. The first attempt at unifying tonnage regulations had been made by the League of Nations in 1925; in 1939, that body had produced a draft Convention together with proposed regulations. The outbreak of the Second World War, however, halted further progress and the plans for a conference to adopt the Convention had to be abandoned for the time being. In 1947, the regulations drawn up by the League of Nations were adopted by a conference in Oslo, but the Oslo Convention, as it was called, was never regarded as a treaty having true international status. The United Nations, in its turn, took up the task of unifying tonnage measurement systems and this work was passed on to IMCO.

This then, was IMCO's first task and has for ten years been one of its major preoccupations. The work of IMCO for ten years culminated in convening an International Conference on Tonnage Measurement of Ships in London from 27 May to 23 June 1969, and from it emerged the International Convention on Tonnage Measurement of Ships, 1969 — the first international agreement ever made in this field. It embodies a unified measurement system for merchant ships engaged on international voyages; it is simpler and more rational than the various national regulations and will be suitable for world-wide application.

The 1969 Convention provides for gross and net tonnage of ships. The gross tonnage is determined from a formula as a function of the total moulded volume of

all enclosed spaces. The net tonnage is derived from a formula as a function of the total moulded volume of cargo spaces, ratio of moulded depth and numbers of passengers.

The Convention will come into force 24 months after it has been accepted by 25 States with combined merchant fleets of not less than 65 per cent of the gross tonnage of the world's merchant shipping. 19 States have accepted the Convention.

Convention on Facilitation of International Maritime Traffic, 1965

It will be seen that the great bulk of IMCO's work is of a technical and legal nature; facilitation marks the one purely administrative problem so far tackled. As early as 1961, the IMCO Assembly had recognized that there was a need for an international agreement on facilitation of international maritime traffic, and approved the establishment of an Expert Group on Facilitation of Travel and Transport.

By January 1965, this Group with its three sub-groups on Customs, Health and Immigration had completed its task and a draft Convention was made. The draft Convention and its technical Annex takes inspiration from the ICAO Convention, Annex 9.

In April 1965, a diplomatic conference convened in London by IMCO established and opened for signature the Convention on Facilitation of International Maritime Traffic, 1965. The Convention came into force on 5 March 1965 and has since been ratified by no less than 36 nations.

The Convention itself lays down the general principles of facilitation, but the Annex sets out the detailed technical provisions of such facilitation by means of international "Standards" and "Recommended Practices". That system has as its principal method of co-operative advancement the self-appraisal by Governments of their own national procedures on arrival, stay and departure of ships, measured against Standards and Recommended Practices. If a State does not find itself in a position to implement such international standards, it has only to notify this fact. The State is thus able to share in negotiating and to recognize the desirability of a measure of facilitation which it cannot, for one reason or another, incorporate at the present stage in its domestic law. A progressive advancement occurs when States find the means to reconcile their procedure with the international norms and practices agreed upon, and also when a particular Recommended Practice, having been generally accepted, is formally transmuted into a Standard.

IMCO's work in the field of facilitation is being encouraged and supported by facilitation committees which already function in several countries and regions, and the Facilitation Conference, 1965, made provisions for progressive international consultation and co-operation through the IMCO Facilitation Working Group, now the Facilitation Committee, to ensure that the Standards and Recommended Practices reflect up-to-date methods and that they actually facilitate maritime traffic.

Athens Convention Relating to the Carriage of Passengers and Their Luggage by Sea, 1974

The newest Convention deposited with IMCO was concluded by an international conference held in Athens in December 1974. The Athens Convention Relating to the Carriage of Passengers and Their Luggage by Sea, 1974 sets out the liability of the carrier for damage suffered as a result of the death of or personal injury to a passenger and the loss of or damage to luggage within certain limits, if the damage caused was due to the fault or neglect of the carrier or of his servants or agents.

Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, 1971

In 1971, the organization convened, in association with the International Atomic Energy Agency, a Conference which adopted a convention to regulate liability in respect of damage arising from the maritime carriage of nuclear substances. The purpose of this convention is to resolve difficulties and conflicts which arise from the simultaneous application of certain maritime conventions dealing with shipowners' liability as well as other conventions which place liability arising from nuclear incidents on the operators of the nuclear installations from which or to which the material in question was being transported.

Future conventions

As mentioned earlier, IMCO is making a constant effort to improve safety at sea, efficiency of navigation and prevention of pollution, bearing in mind new trends and technological developments in maritime transport.

For the immediate future it is planned to convene the following international conferences:

- 1975 Conference on Maritime Satellites
- 1976 Legal Conference on
 - (a) Limitation of liability of owners of sea-going vessels;
 - (b) Civil liability for pollution damage from

substances other than oil.

Conference on Safety of Fishing Vessels.

1977 Conference on Crew Training and Certification

1978 Conference on Search and Rescue System

Conference on Legal Status of Hovercraft

1979 Conference on Safety of Novel Types of Craft

1980 Conference on Enforcement of Legal Measures to Combat Marine Pollution.

Conclusion

IMCO could be said in a very real sense to have derived its existence from the need to safeguard the lives of those who go to sea. I am very well aware that human life in this day and age is not perhaps as sacrosanct as it was in more settled times. But surely we can all join in agreeing that the lives of seafarers must be protected to the highest possible degree. Humanity could not demand less. And looking at it on a much lower plane, the skilled seafarer represents a capital investment certainly not less important than the ship in which he sails. It is for this reason that what might appear to be an unnecessarily complicated and heavy series of international agreements is, in fact, no more than a set of basic safety standards. Work in these fields must continue and, while we are all aware that perfect safety cannot be achieved, we should leave nothing within the realm of possibility which can be done to conduce towards it.

To take a second example, that relating to the prevention of pollution from ships, this again is a struggle in which the whole of the shipping world must participate. From the point of view of developing countries, it might be argued that the protection of the environment and the prevention of pollution is a secondary matter, but, if I may express a personal opinion, I think this argument can be carried too far. Surely the right approach is to obtain the benefits of industrialization but, learning from the hard lessons of others, to avoid its worse consequences.

These are two examples of realms in which all countries with maritime interests or ambitions have a common stake. They are examples, I suggest, of the justification for a technical and practical agency such as IMCO.

ANNEX I PROGRAMME

Date	Sr. No.	Subject
Monday 17 March	1.	Inauguration Introduction — Regional maritime review
	2. (a)	Role of shipping in a developing economy
Tuesday 18 March	(b)	Technological developments in ship design and choice of ships suitable for the maritime traffic of developing countries.
Wednesday 19 March	3.	Tramping operations and operations of tankers, bulk carriers and other specialized vessels.
Thursday 20 March	4.	Management and operation of shipping services: (a) Shipping company organization (b) Management techniques — voyage estimates and cargo selection
Friday 21 March		(c) Management techniques — Investment appraisal I (d) Management techniques — Investment appraisal II Case Study
Saturday 22 March		Excursion to the "Ancient City"
Sunday 23 March		Free
Monday 24 March	5.	Investment in ship acquisition
	6.	Route research analysis and planning
Tuesday 25 March	7.	Cost of ships' time
Wednesday 26 March	8.	Chartering: (a) Voyage and short-term chartering (b) Time and long-term chartering (c) Contract shipments (d) Chartering exchanges
Thursday 27 March		
Friday 28 March		
Saturday 29 March		
Sunday 30 March		
Monday 31 March	9.	Presentation of country papers
Tuesday 1 April	10.	Multinational shipping enterprises
Wednesday 2 April	11.	The application of a convention on international intermodal transport to developing countries of the ESCAP region

Date	Sr. No.	Subject
Thursday 3 April)	12.	Operation of liner services:
Friday 4 April)	(a)	Organization and operation of conference system
	(b)	Cross trade operations
	(c)	Way port operations
Saturday 5 April)		Excursion to Pattaya Beach
Sunday 6 April)		
Monday 7 April)	13.	Ports:
Tuesday 8 April)	(a)	Technological change and the demand for port services
Wednesday 9 April)	(b)	Financial policies and present charging practices of port authorities
	(c)	Impact of cargo unitization on the developing countries' ports
	(d)	The planning and management of container terminals
	(e)	Some aspects of public responsibilities to the development of ports and port industries
	(f)	Port performance indicators
Thursday 10 April	14. (a)	Review of international conventions and agreements relating to maritime traffic
	(b)	Traffic separation schemes
Friday 11 April	15.	Field visit to Bangkok Port
Saturday 12 April	16.	Valediction

ANNEX II LIST OF LECTURERS

Mr. G.S. Sturmev, Deputy Director and Chief of the Shipping Branch, UNCTAD, Geneva.

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Mr. David R. Coates, Department of Industry, London.

Mr. A.E. Morris, The Institute of Chartered Brokers, Baltic Exchange Chambers, London.

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- Mr. M.M. Tembulkar, Deputy Manager, Shipping Corporation of India Ltd., Bombay.
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- Mr. R. Effendi, Chief of American/Australian and Planning Section, Foreign-going Shipping Service, Directorate of Traffic and Sea Transport, Directorate-General of Sea Communications, Jakarta.
- Iran** Mr. H. Peyvandi, General Director of Shipping Affairs, Ports and Shipping Organization, Tehran.
- Mr. M. Rouzbeh, Head of Navigation Control Department, Port and Shipping Organization, Tehran.
- Khmer Rep.** Mr. En Chamroeun, Chief of Central Area of Merchant Marine, Ministry of Public Works, Phnom Penh, Khmer Republic.
- Malaysia** Miss S.A. Abod, Assistant Director, Shipping and Freight Study Unit, Ministry of Trade and Industry, Kuala Lumpur.
- Mr. M.B. Abid, Marketing Manager, Malaysian International Shipping Corporation, Coastal Services, Kuala Lumpur.
- Pakistan** Mr. M.A. Siddiqui, Section Officer, Port and Shipping Wing, Ministry of Communications, Karachi.
- Mr. Munir-ur-Rahman, Deputy Controller of Shipping, Department of Shipping Control, Karachi.
- Papua New Guinea** Mr. A. Roffey, Superintendent of Shipping, Department of Transport, Port Moresby.
- Philippines** Mrs. G.C. Oblena, Chief, Shipping and Freight Research Office, Department of Trade, Manila.
- Mr. C.M. Marcelo, Assistant to the General Manager, Maritime Agencies & Services, Inc., Manila.
- Republic of Korea** Mr. S.H. Ahn, Senior Officer, Maritime Personnel Administration Division, Maritime Transport Bureau, Ministry of Transportation, Seoul.
- Mr. J.H. Choi, Assistant Chief, Overseas Shipping Division, Maritime Transport Bureau, Ministry of Transportation, Seoul.
- Republic of Viet-Nam** Mr. Vo-Huu-Hien, Chief, Inspection Ships of Traffic Safety, Directorate of Navigation RVN, Gia-Dinh.
- Singapore** Mr. P.C. Au, Deputy Director, Department of Trade, Ministry of Finance.
- Mr. H.L. Seah, Deputy Director, Marine Department.
- Mr. Lim Teck Ee, Marine Surveyor, Marine Department.
- Mr. Foo Khee Suan, Assistant Technical Planner, c/o Container Terminal, Port of Singapore Authority.
- Sri Lanka** Mr. U. Jayasinghe, Deputy Liner Manager, Ceylon Shipping Corporation, Colombo.
- Thailand** Mr. Sutham Chitranukroh, Engineer, Transport and Communications Economic Division, Ministry of Communications, Bangkok.
- Mr. Udonsak Poonyasawat, Statistician, Transport and Communications Economic Division, Ministry of Communications, Bangkok.
- Miss Ladda Honghern, Economist, Transport and Communications Economic Division, Ministry of Communications, Bangkok.
- Lt. Cdr. Chumnong Pengjit R.T.N., Chief of Administration Department, Thai Maritime Navigation Co., Ltd., Bangkok.
- Mr. Pinit Tassanapirom, Assistant Manager, Allied Shipping Co., Ltd., Bangkok.
- Mr. Kamol Kulanet, Assistant Manager, Thai Freight Centre Co., Ltd., Bangkok.

ANNEX IV
REPORT OF THE SEMINAR-CUM-TRAINING
COURSE ON TECHNICAL AND OPERATIONAL
ASPECTS OF SHIPPING

PROCEEDINGS

Introduction

The Seminar-cum-Training Course on Technical and Operational Aspects of Shipping was held at Bangkok from 17 March to 12 April 1975. It was organized by the Economic and Social Commission for Asia and the Pacific (ESCAP) with the financial support of the Danish International Development Agency (DANIDA).

The Seminar-cum-Training Course was attended by 31 participants from the following 14 countries of the ESCAP region: Bangladesh, India, Indonesia, Iran, The Khmer Republic, Malaysia, Pakistan, Papua New Guinea, The Philippines, Republic of Korea, Republic of Vietnam, Singapore, Sri Lanka and Thailand.

Denmark, the United Kingdom and ESCAP, provided the services of their experts and lecturers. The United Nations Conference on Trade and Development (UNCTAD) and the Inter-governmental Maritime Consultative Organization (IMCO) participated in the seminar and provided preparatory assistance.

Mr. J.B.P. Maramis, Executive Secretary, ESCAP, in his opening address, said that, during the previous decade, ocean transportation had undergone a revolution in scale, technology and operation, the impact of which was bound to have far-reaching effects on the developing countries of the region. On the other hand, ships of the developing countries were by and large obsolete and uneconomic. This had led to increasingly heavy repair and survey costs and to rising insurance premiums. More than half of the vessels in the existing fleets of the region would have exceeded their economic life by the end of the decade, not taking into account the much more rapid economic obsolescence resulting from the pace of technological development in ship design and cargo handling methods.

Mr. Maramis further stressed the need for regional shipping to adapt itself to the increasingly specialized types of ocean transport and to diversify the composition of fleets. A co-ordinated multinational approach through joint endeavours could provide opportunities for sharing the capital cost, gaining access to larger freight markets, optimizing ships' capacity, broadly increasing the pooling of personnel and expertise and spreading risks more widely. The joint ownership and/or operation of specialized vessels for handling export commodities, such as jute, rubber, rice, logs and lumber, palm and coconut oil, and rubber latex, pointed to the profitability of joint ventures. While investment programmes in shipping had to ensure reasonable and favourable returns, optimum efficiency in port utilization had to be achieved to prevent the danger of over-investment. While there was need to improve port infrastructure in the region to cater to modern ships, it was also prudent for shipowners to develop ships and rationalize shipping suited to the physical and other characteristics of those ports.

Course programme

A broad-based comprehensive programme had been designed to cover various aspects of shipping and related areas. The course provided ample opportunity for an analysis of the close interdependence and relationship between the technical and operational aspects of shipping, port facilities and related services. The main contents of the programme were:

- (a) Lectures and discussions;
- (b) Case studies;
- (c) Technical excursion organized on the river Chao Phya up to the Gulf of Thailand, and the inspection of a conventional break-bulk ship converted with side ports for handling unitized loads;
- (d) Study tour of port facilities;
- (e) Presentation of country papers.

The course programme was designed to be problem-action-oriented reflecting relevant and immediate problems confronting the developing countries, and was intended to be more practical than theoretical with the primary objective of creating a forum for discussions and exchange of ideas. To meet that objective, each participating country was required to prepare and present a country paper at the seminar, discussing the problems related to the themes of the course, e.g. operation of liner and non-liner services and maritime legislation. The discussions of country papers enabled the participants to share experiences and identify common problems, and was thus expected to lead to regional and subregional co-operation in the field of shipping.

The participants were given a general maritime review of the region with emphasis on the importance of the role of shipping in a developing economy. They reviewed the technological developments in ship design and choice of ships suitable for the maritime traffic of developing countries, studying in depth the operations and management of shipping services for tramp vessels, tankers, bulk carriers and specialized ships, management techniques, route research analysis and planning, voyage estimates, cargo selection and rationalization of services. In addition, two case studies were made on the appraisal of investments in shipping.

Much attention was given to the cost of ship's time at sea and in ports. The operation and organization of conference systems, cross trade operations and way port operations were also reviewed in the context of regional problems. Voyage and short-term chartering, time and long-term chartering, contract shipments, and the organization and operation of chartering exchanges, particularly the operations of the Baltic Exchange, were studied.

Regarding ports, the participants studied technological changes and the demand on port services, port pricing policies, the impact of cargo unitization including planning and management of container terminals and port performance indicators.

In the field of maritime legislation, a review was made of the international maritime conventions and agreements, traffic separation schemes and the legal implications of international inter-modal transport by a multimodal transport operator (MTO), as might be relevant in the future handling of traffic in the developing countries of the ESCAP region.

Conclusions and recommendations

The seminar provided a broad-based knowledge of maritime subjects on a policy-making level, with emphasis on the impact of technological development on the developing countries.

Most of the countries represented in the seminar faced similar problems in their maritime development and felt that there was a strong need for the maintenance of dialogue between the countries of the ESCAP region in order to foster regional and sub-regional co-operation and share their experiences in that specialized field.

In conclusion, the participants expressed their gratitude and appreciation to ESCAP and DANIDA for the valuable assistance rendered to their countries in organizing the programme. They felt that such a training course and workshops should be held as frequently as possible, with specific themes to cover important sectoral developments in shipping. They also expressed their deep appreciation of the untiring efforts of the ESCAP staff in making the seminar a success, and in particular of the director, Mr. Haroon Ebni Ali who had organized and conducted the seminar.

Recommendations for future ESCAP activities

- (a) Organization of training seminars on an annual basis, rotating the venue in the region.
- (b) Intensification of technical assistance, research,

and training programmes in the following areas:

- (i) Shipping management and operations;
 - (ii) Maritime law;
 - (iii) Ship building and ship repairs;
 - (iv) Study of the feasibility of establishing a chartering organization/exchange on a regional and subregional basis;
 - (v) Port management and port operations;
 - (vi) Studies of individual ports, identifying problem areas and advisory services on development plans.
- (c) Survey/studies/advisory services on the composition and choice of ships most suitable for specific traffic requirements of individual countries.
 - (d) (i) Identification of areas of possible regional/subregional co-operation in the maritime field;
(ii) Cost/benefit analysis: an in-depth study of all relevant factors to determine the most suitable form of multinational shipping enterprises on a regional/subregional basis.
 - (e) Studies/advisory services, upon request, on the aggregation of cargo with reference to the specific needs of each country in the ESCAP region.
 - (f) Detailed feasibility study on the application of the barge-carrying system (LASH) in the ESCAP region.
 - (g) Provision of training and advisory services to assist shippers' organizations/freight study units in the ESCAP region.
 - (h) Provision of assistance to the developing countries in the ESCAP region in the rehabilitation, modernization and augmentation of navigational aids and the establishment of traffic separation schemes, particularly in areas of high traffic density.

ANNEX V

SEMINAR EVALUATION

This seminar evaluation is based on the comments of the lecturers and the participants. The participants' comments were obtained from their closing statements and through a specially prepared questionnaire. This questionnaire was divided into three sections: (a) organization and administration, (b) relevance and applicability and (c) future training requirements.

The preparatory administrative work of the seminar was good and the participants had received, well in advance, adequate information on the objectives of the course, course content, accommodation, travel arrangements etc. Administrative and technical arrangements including airport reception, group transportation for official functions, return travel arrangements, advance information on daily schedule and changes therefore were very satisfactory. Hotel accommodation was adequate and comfortable. The conference facilities were found suitable and the programme was such that the participants felt that the composition and balance of subjects and the time devoted to each was satisfactory. It was agreed that all the subjects were interesting, although some subjects generated more discussion than others. The standard presentation of lectures and their content was found to be satisfactory and the time devoted to country papers beneficial.

The social programme that was organized for the participants was relaxing and comfortable. In the first week, the participants went on a tour to the Ancient City. In the second week, they went on a technical excursion on

the Chao Phya River down to the Gulf of Thailand. In the third week, they went to Pattaya Beach, about 150 km from Bangkok.

As to the relevance and applicability, the participants found the content of the course relevant to the conditions in their countries and felt that they would be able to use the increased knowledge when they returned home.

Future managerial responsibilities were identified for further specific training requirements, and the list was given to the ESCAP secretariat.

The participants were aware of the continued and increasing need for training in the field of shipping and requested the ESCAP secretariat to continue and expand the range of existing programmes. They felt that, although the structure of the course was practical, future courses should place more emphasis on practical problems of regional content.

It was concluded that the problems confronting the developing countries in the ESCAP region were similar but they might not have a common solution since governmental policies differ from country to country. The participants recommended that the venue of future seminars and workshops should be rotational, so that the participants could get an opportunity of knowing more closely the maritime problems and solutions thereof of the other ESCAP developing countries besides promoting regional co-operation.

**ANNEX VI
COUNTRY REPORTS**

1. BANGLADESH

1. Introduction:

Due to her geographical situation Bangladesh is a natural maritime nation. Our people have been sea-faring dating back many centuries. Nearly half the seamen of the present Indo-Pak-Bangla Sub-Continent before 1947 (year of partition and independence of the Sub-Continent) came from Bangladesh. They have won a reputation throughout the shipping world for their outstanding seamanship. But ironically, during the long era of our political history before 1971, notwithstanding our remarkable maritime traditions not even one out of the 71 ocean-going ships flying the Pakistan flag was based in Chittagong Port.

The importance of a Merchant Navy for a developing country like Bangladesh striving for economic self-reliance can hardly be exaggerated. Our national flag carriers are required not merely to save foreign exchange by carrying as much as possible of our import and export cargoes, but also to decide more independently to fix our import and export targets. We cannot afford to depend on other shipping lines always for timely movement of our outward and inward cargoes in the event of crisis. Ever increasing freight rate by the liner ships and tramps is another reason why we must develop our own mercantile marine. Indeed, there is a close relationship between a country's shipping and foreign policy. Shipping forms one of the bases of foreign service and foreign relationship.

When Bangladesh, during her stay with Pakistan, tried to find her identity with the rest of the world through developing a merchant fleet, this natural right was torpedoed by the then ruling clique. The port of Chittagong was not allowed to gain her due importance as an international trading port. So we had to carry a persistent political struggle throughout the long road towards liberation of Bangladesh on the 16th December, 1971. However, after liberation of the country we were able to give a humble start to a national shipping line in early 1972. So our Merchant Navy is perhaps the youngest in the world today.

The importance of our shipping fleet lies in the maintenance of a supply line with the rest of the world, situated as we are with a relatively small degree of self-sufficiency in respect of capital goods, machinery, spare parts and some other merchandise. Bangladesh is a small and poor country. But for our own survival we must strive to be a power in terms of merchant shipping. It is of paramount necessity that we develop shipping in order to earn and save foreign exchange for our economy when precisely the scarcity of foreign exchange has formed the bottleneck in our growth.

2. Operation and Management of Shipping Services:

Ocean shipping is reserved exclusively for the public sector in Bangladesh. Soon after we had successfully driven out the occupation forces from the soil of Bangladesh on the 16th December, 1971 we turned our

attention to this field of shipping. The Bangladesh Shipping Corporation was formed under Presidential Order No. 10 of 1972 and came into being on the 5th February, 1972. This Corporation was established for the purpose of ensuring proper operation and development of shipping and ocean transport services. The following are the main assignments given to the Corporation:-

- (a) To provide safe and efficient shipping services on international routes; and
- (b) To acquire, charter, hold or dispose of ships or crafts.

The entire share capital of the Corporation is subscribed by the Government. It is an autonomous Corporation and is run on commercial considerations. The Managing Director is the whole-time Chief Executive of the Corporation. He is also the Chairman of the Board of Directors. At present there are three Directors- Managing Director, Finance Director and one ex-officio Director. Like any other Shipping Corporation, the Bangladesh Shipping Corporation is divided into operational, commercial, engineering, marine, administrative, finance and accounts Departments in the interest of efficient management.

At its birth the Corporation did not inherit or acquire even a single ship. So the Corporation entered into an Agreement with the Shipping Corporation of India by which for a period of one year a few Indian ships were made available in order to carry our export cargo. The Government of India also made a credit available to Bangladesh for the purchase of two Indian ships for the Corporation. So, right from her birth the Bangladesh Shipping Corporation started carrying our jute export by chartered ships. In March 1972, it also carried our rice import from Burma. By June 1972, the Government of India transferred the first ship named "Bishwa Prem" to the Bangladesh Shipping Corporation which renamed her "Banglar Doot". In June 1973, the second Indian ship was acquired by the Corporation. In addition, we received assistance from friendly countries and in this way the number of ships today in the fleet of the Corporation has gone up to 14 with a total capacity of 120,000 DWT. The larger vessels of this Corporation are employed in the Bangladesh/India/U.K.-Continental trade and the smaller ones are operating on the Bangladesh-East Coast of India trade. In March 1972, the Bangladesh Shipping Corporation prepared a project report on acquisition of ships. The report contains a forecast and estimate of requirement of tonnage up to 1982. This report studied and analysed the following basic points:-

(a) Due to the nature of the traditional exports and imports, the trade in which the Bangladesh flag vessels should participate. This was considered important from two points of view:-

- (i) The ports at which the vessels will call, the facilities available at such ports, particularly in respect of restrictions in draft availability, length, beam etc.
- (ii) The types of cargo which will be carried in

such vessels — both export and import.

(b) Analysing the above factors along with quantum of movement, the Corporation recommended to the Government the type of vessels which would be best suited in terms of dead weight capacity, draft, cubic capacity, speed, consumption, bunker capacity, cargo handling appliances, number of holds and hatches and arrangement of deck etc.

(c) The project report also considered the most important and at once uncertain and difficult point of financing the ship purchase. With the acute foreign exchange position of the country, it is impossible to find the finance required to acquire ships. So the report gives a few alternative methods of organizing credit facilities. Three basic credit procedures were considered:-

- (i) The prospective buyer purchasing from the seller with the seller giving credit by means of his having first mortgage and assignment of insurance policies. Additionally, an owner might require further security, such as mortgage in another vessel owned by the prospective buyer, a personal guarantee or assignment of freights in the case of the vessel being taken on a long period employment.
- (ii) The second method is by means of a bank guarantee whereby the prospective buyer offers the vessel to his bankers on security for a loan enabling the Bank to give as security their irrevocable guarantee. This method would be preferred by the sellers as they have the facility for discounting for cash. But one must bear on mind that on this basis firstly the bank would require commission or payment for granting the guarantee and secondly the owners might require a premium on the price to take into account the cost of their discounting such guarantee.
- (iii) The third method is to raise loans from foreign commercial banks. These banks naturally operate on commercial principles and on profit basis. It is, however, recognized that commercial banks are reluctant to advance large funds for periods exceeding 3 to 5 years.

3. Operation of Liner Services:

The Bangladesh Shipping Corporation became a member of the Bangladesh/U.K.-Continent Conference from February 1973, and ever since has been operating both East and West bound liner services according to its entitlement in the pool share of the Conference. The organization and other operational matters within this conference arrangement are being looked after with the help of a Regional Office in London where senior commercial and technical executives are stationed. On their advice and reports on the basis of development taking place in various trades, the management in Dacca takes appropriate decisions.

Although there is no restriction to participate in cross trade operations, in view of the limited number of ships at present the Bangladesh Shipping Corporation cannot presently take full advantage of this trade.

Nevertheless, at times Bangladesh flag ships after fulfilling their liner commitments on outward trade from Bangladesh load export cargo from U.K. Continent area, if available for U.S. East Coast Ports. After discharging these cargoes in U.S. East Coast Ports the vessels then load import cargo for Bangladesh from U.S.A. It so happens that at times if there is not enough cargo from U.S.A. East Coast Ports for Bangladesh then the vessels according to commercial consideration also carry cargo for South East Asia ports like Singapore, Kuala Lumpur etc., on the way back to Bangladesh via the Panama Canal. The Bangladesh Shipping Corporation is also a member of the Straits/Calcutta/Bangladesh Freight Agreement and operates occasional services between Bangladesh and Singapore.

In the U.K.-Continent trade, as a liner carrier, the Bangladesh Shipping Corporation also at times does carry cargo for way ports when there is not enough cargo within the main conference range ports. In the outward trade the way ports of call are normally in the East/West African ports like Mombassa, Apapa and Takoradi etc. In the home bound trade from U.K.-Continent the way port of call is normally Colombo, subject to inducement.

4. Non-Liner Operations:

The Bangladesh Shipping Corporation does not have any regular tramping operation except the cross-country trades mentioned above. The Corporation also does not have any tanker/bulk carrier or other specialized vessels at the moment.

Voyage and short term chartering — The Corporation is acting as the chartering agents of various Government Ministries and Public Corporations involved in importing bulk commodities like foodgrains, fertilizer, phosphate, coal, cement, and POL products. The Corporation normally goes out in the main chartermarkets, namely — London, New York and Tokyo and fixes vessels which are offered through various brokers on the basis of most competitive rates and other terms and conditions which suit a particular transportation.

Time and long term chartering — At times the Corporation in order to meet its liner requirement does take vessels of other flags on time charter to complete either one leg of a voyage or a round voyage. Similarly, the Corporation at times due to a slump in trade movement, as being experienced now due to economic recession throughout the world does charter out its own vessels on time charter for a round voyage or consecutive voyage basis not exceeding 6-8 months. During the initial period of its operation the Corporation took some vessels on long term time charter basis to meet its conference commitments.

Contract shipments — Although this term of operation is not being undertaken very often but at times the Corporation has carried such shipments. One recent example is in transporting railway locomotives in CKD condition and spares from Romania to Bangladesh.

5. Co-operation in Shipping:

Bangladesh has not yet entered into the field of

multinational shipping enterprises, chartering exchanges and freight forwarding agencies. However, Bangladesh has entered into a bilateral Agreement with the German Democratic Republic for co-operation in establishing shipping services between the two countries.

6. Technological Developments in Shipping:

Although many technological developments in the form of new types of ships namely container ships, RO/RO ships have taken place and are being operated in various trades of the developed countries to minimize cargo handling costs and vessels port time, many developing countries are not likely to be affected by such technological changes for many years to come. For example, the import and export trade pattern of Bangladesh is such that the operation of sophisticated vessels as mentioned above is not called for. However, to reduce the cost of a vessel's operation in our trade there is definite scope for introducing other methods of unitization especially the LASH system. To experiment this type of vessel operation one US Shipping Operator namely M/S. Waterman Steamship Company has included Bangladesh ports in its USA-India-Pakistan Far East service which is going to be started by the end of March 1975. From this operation Bangladesh will not doubt gain some invaluable experience which will be helpful in planning future acquisition and types of ships to be used in our trade.

7. Maritime Legislation:

Bangladesh has not yet formally become a signatory to any of the international conventions on merchant shipping. But as a legacy of the previous regime's decision it is continuing to adhere to various rules and regulations of the International Convention on SOLAS, 1960, and the International Convention on Load Lines, 1966. However, it is under the active consideration of the Bangladesh Government to formally become a signatory to the above conventions and also become a member of the Inter-Governmental Maritime Consultative Organization.

The application of a Convention on International Intermodel Transport to developing countries of the ESCAP region — It is difficult to make any positive comment because various implications of introducing such a transport system have not yet been explained fully to the developing countries. In the second preparatory group meeting on the said Intermodel Convention which was held in Geneva in November 1974, it was decided that further studies have to be made, especially by the UNCTAD secretariat, for explaining the various implications so that the developing countries can study them and participate in the discussion for taking a decision in the matter. It is expected that during the third preparatory group meeting scheduled to be held in Geneva during July/August 1975 more light will be thrown on the subject.

8. Mercantile Marine Administration and Training:

The Merchant Marine Administration with special

reference to implementation of rules and regulations under national and various international conventions relating to safety aspects are controlled and supervised by the Mercantile Marine Department. The national rule are more or less adopted from the British Merchant Shipping Act, 1894. Of course steps are being taken to formulate our own rules. The Department is headed by a Principal Officer, assisted by a Nautical Engineer and Ship Surveyors.

For providing pre-sea training for nautical and Engineering Cadets and seamen there are two shore based establishments viz the Marine Academy and the Seamen's Training Centre, both located at Chittagong the principal maritime port of the country. The Marine Academy recruits cadets who have passed the Higher Secondary Certificate Examination in Science with Mathematics and Physics in the age group of 17 - 20 on the basis of open competition. The course is spread over a period of 2 years. On successful completion the nautical cadets join ships direct and the Engineering Cadets undergo another 3 years' training in Marine Engineering Workshops before joining ships. In the past we have offered training facilities to friendly neighbouring countries and a few cadets from Iran, Malaysia and Indonesia were trained in the Marine Academy, Chittagong. Training facilities are made available on request for a limited number of cadets from friendly countries.

For providing pre-sea training for apprentice seamen there is a Seamen's Training Centre where the basic knowledge of seamanship is taught to various categories of crews. The course extends over a period of 6 months.

2. INDIA

India, with a vast coastline stretching over 5,700 kilometres, holds a pivotal position in the sub-Continent and the South Asian region. She has a glorious maritime heritage. History has on record to show that the Indian shipping and ship-building industry had flourished from time immemorial and Indian ships had crossed the high seas, carried trade and commerce to far-off lands and kept contacts with great civilizations of the past. But, with the advent of steam and motor ships, the Indian shipping received a grievous set-back. During the eighteenth and nineteenth centuries and in the days before the Second World War, the Imperial Powers were vying against one another to establish maritime supremacy and to preserve their special interests and hegemony. Colonial powers frowned on attempts by several nations to enter the field of shipping. Against these heavy odds, early in the twentieth century efforts were made by patriotic Indians to revive the national shipping industry, but the fierce competition from foreign vested interests made the progress of Indian shipping extremely difficult. It was a hard struggle for existence. That some of them survived and achieved their objective to some extent was as much a miracle as a tribute to their perseverance and dedication.

The Second World War changed the picture. Even before Independence the then Government of India appointed in 1945 a Reconstruction Policy Sub-Committee on Shipping. The Committee submitted its report

early in 1947 and its recommendations laid down the foundations for the development of a modern shipping industry in India.

After Independence, the Government of India formulated its own shipping policy, undertook a phased programme of development of Indian shipping and took several steps to implement it during the successive Five Year Plans. Indian shipping expanded steadily during the last 25 years. In 1947, India had only 59 ships of about two lakhs gross registered tons. By the end of 1974 the fleet had expanded to 293 ships comprising over 36.4 lakhs gross tons of which 232 ships of about 33.6 lakhs tons are employed in the overseas trades and the remaining in the coastal trade of India.

A very important event in the history of Indian shipping was the establishment of a public sector shipping company as a major instrument for the implementation of the national shipping policy. The Shipping Corporation of India, which is a fully Government-owned company, was formed in October, 1961. During the last 13 years the Corporation has made rapid progress in augmenting its fleet and has achieved not only a pre-eminent position within the Indian shipping industry but has also grown to be one of the largest shipping lines in the world. While in 1961 it had a fleet of only 19 ships of 1.39 lakhs gross tons its tonnage by the end of 1974 increased to 115 ships aggregating 17.67 lakhs gross tons i.e. about 2.822 million deadweight tons. A noteworthy feature of the expansion of the Corporation's fleet has been the planned diversification of its composition into bulk carriers, ore — bulk-oil-carriers and large size tankers besides cargo liners, in keeping with modern international trends. The Corporation has a huge expansion programme. The recent addition, which is the largest vessel on the Indian Register now, is a 127,468 DWT bulk carrier "M.V. GAUTAMA BUDHA". The Shipping Corporation has a wide network of cargo services covering almost all important trade routes of the world, besides catering to India's coastal trade requirements and passenger services in the near trades. The various international and other services presently operated by the Corporation include services to Bangladesh, East Africa, Mauritius, West Asian Gulf, Red Sea ports, Australia, Far East/Japan, Mediterranean/Adriatic ports, Black Sea ports, U.K./Continent, Poland, G.D.R., U.S.A. (Atlantic and Gulf of Mexico), Pacific coasts of U.S.A. and Canada and Canadian East Coast ports including Great Lakes ports. The Corporation also runs passenger-cum-cargo services to Sri Lanka, East Africa, Malaysia, Singapore, Andaman Nicobar and Minicoy Islands etc. in the Indian Ocean. The Corporation's tanker services in the coastal and overseas trades, the overseas bulk carrier services and world-wide tramping services have been able to cater to a substantial volume of India's overseas trades.

It has been the accepted policy of the Government of India that both public and private sectors in shipping should fully co-operate to mutual advantage in the larger national interests and both sectors should play an equally important role in the expansion of national shipping for which equal opportunities should be provided. Having regard to the ambitious programme of shipping, there is

plenty of scope for both private and public sectors to serve the country and provide adequate regular shipping services for promotion of India's expanding trades. Apart from the Government-owned Shipping Corporation, there are 33 private shipping companies, big and small, operating in the coastal and overseas trades of India with a fleet of 162 ships aggregating 17.66 lakhs gross tons. Being member lines of the overseas shipping conferences governing the trades from UK/Continent, Poland, GDR, Black Sea USA, Canada etc., some of them have their ships regularly employed in these liner routes, while others do have bulk-carriers, tankers and tramp ships which are employed in the overseas and cross trades.

One important landmark in the development of Indian shipping was the constitution of the Shipping Development Fund in 1958 by the Government of India. Long-term rupee loans are made available at concessional rates of interest from this revolving fund for financing or refinancing the purchase of ships for Indian shipping companies. The Shipping Development Fund Committee has so far sanctioned loans to the extent of Rs. 536 crores from the inception to various shipping companies. The Development Fund and the Development Rebate, a fiscal measure of tax relief (to be discontinued from 1st January 1976), have been two major factors behind the rapid expansion of Indian merchant fleet.

During the First and Second Five Year Plans (1954 to 1964), the targets set for developing Indian shipping have been achieved for all practical purposes and the tonnage increased from 3.9 lakhs to 8.57 lakhs GRT by the end of the Second Plan. The expansion of the Indian shipping fleet has been accelerated since the Third Five Year Plan, helped greatly by the finance available from the Shipping Development Fund and the rapid growth of the public sector. It is specially noteworthy that during the successive Five Year Plans the tonnage target in shipping has been not only achieved but actually exceeded. At the end of the Third Plan period, Indian tonnage in operation was over 15 lakhs GRT, with ships aggregating about 5 lakhs GRT under construction. The Fourth Five Year Plan (1969 to 1974) target for shipping was 4 million GRT consisting of 3.5 million GRT in operation and 0.5 million GRT firmly on order. As against this, the operative tonnage at the end of the Fourth Five Year Plan period i.e. 31.3.74, was only 3.04 million GRT, being short of the target by about 0.5 million GRT. At the end of the Plan period, the Indian shipowners had, however, under construction or on order in India and abroad ships aggregating 2.12 million GRT which included a number of bulk-carriers, OBOs and tankers and 3 VLCCs of 120,000 GRT each. Thus, in fact, the tonnage has far exceeded the Plan target. The shipping target set for the Fifth Five Year Plan commencing from 1.4.74 is 9.6 million GRT consisting of 8.6 million GRT in operation and 1 million GRT firmly on order at the end of the Plan period. With the attainment of the above targets envisaged for the Fifth Plan, the Indian shipping tonnage would be adequate to carry 100 per cent of the country's overseas trade in crude oil and petroleum products, 50 per cent of iron ore exports to Japan, 100 per cent of iron ore exports to Europe and 50 per cent of liner trades. The acquisition

programme envisaged in the Plan is weighted suitably to support the requirements of the country's trade, both in bulk and in general cargo movements.

The ship-building industry in the country is making rapid progress. The shipbuilding yard at Visakhapatnam established by the Scindia Steam Navigation Co., in 1941 was taken over as a public sector concern in 1952. The yard has been developed to enable it to construct ships of various types and sizes and during recent years overseas liner vessels of about 10/12,000 DWT were being built at this yard at the rate of 3 ships per year and its capacity is expected to be increased to 6 ships per year in the course of the next few years. Recently "Pioneer" class multipurpose vessels of 21,500 DWT are being built at this Yard and these are the biggest vessels built in India so far. The Shipyard at Cochin has been established recently with Japanese collaboration and the yard, when completed, will be capable of building ships of the size up to 85,000 DWT and can undertake repairs of ships up to one lakh DWT. The first of the series of ships proposed to be built at this Yard is 75,000 DWT 'Panamax' type bulk carriers. The Mazagon Dock at Bombay and the Garden Reach Workshop at Calcutta, which are intended mainly to cater to the requirements of the Indian Navy, have also the capacity to build merchant ships. A luxury passenger-liner has been recently built at the Mazagon Dock for operation by the Shipping Corporation of India in the India/East Africa passenger-service. The Garden Reach Workshop has drawn up plans for constructing ships in the 25,000 DWT class.

In view of the steady growth of the Indian shipping industry during recent years the need for expansion of ship-repair and dry-docking facilities in the country to ensure efficiency and economic maintenance of ships has been fully appreciated and steps have been taken in this direction by the Government of India. Based on the recommendations of a Central Advisory Committee, ship-repair and dry-docking facilities which are at present available in Bombay, Calcutta, Vizag and Goa are being improved and additional facilities are proposed to be provided keeping in view the rapid expansion of Indian shipping, which include large bulk carriers and tankers. Owing to various factors, such as lack of indigenous material and equipment, import restrictions etc., the existing ship-repair and drydocking facilities are, however, inadequate and Indian ships are often obliged to go to foreign ports for carrying out survey and repairs.

A feature of the development of Indian shipping is the forging of strong shipping links, on a bilateral basis, with other friendly maritime countries for the carriage of the trade between India and those countries on the basis of equality. Agreements with the USSR and Poland are examples of this. In 1959, India concluded a bilateral shipping agreement with the USSR for the operation of a regular shipping service between the Soviet Black Sea ports and Indian ports on a parity basis. This agreement is being reviewed from time to time. The three Indian lines (Shipping Corporation of India, Scindia Steam Navigation Co., and India Steamship Co.) are members of this Indo-Soviet shipping service and are jointly operating the service in co-operation with Soviet shipping

lines. Similar understandings exist for joint shipping services with GDR and UAR. Recently an agreement has also been concluded between India and Iran for the establishment of a joint shipping line in Iran which can be regarded as a break-through for Indian shipping. Under this Agreement, the Shipping Corporation of India will, in collaboration with the Arya National Shipping Line of Tehran, set up a new company named "Irano-Hind Shipping Company" for which the required technical expertise will be provided by the Shipping Corporation of India and financial assistance by the Iranian side.

In the overseas sector, Indian shipping is at present having a share of 45 per cent so far as the liner trades are concerned. The major portion of India's overseas trade, however, consists of bulk commodities like iron-ore, petroleum products, foodgrains and fertilizers which move in tramp ships. In the carriage of these commodities, the share of Indian shipping is still small with the result that the over-all share of Indian shipping in the overseas trades is less than 20 per cent.

A Shipping Co-ordination and Chartering Organisation set up in the Ministry of Shipping and Transport of the Government of India has been functioning effectively since 1960, its main function being to centralize and co-ordinate the shipping arrangements for all Government owned and controlled cargoes, imported and exported by the various government departments, projects and undertakings, and to make optimum use of available Indian tonnage. The Central Chartering Organisation has undertaken the work of chartering ships for carrying bulk cargoes like foodgrains, fertilizers, rock phosphate, sulphur, ores and minerals, sugar, crude oil, petroleum products etc. on behalf of the various projects and undertakings by inviting tenders for procuring ships at competitive rates. Competitive offers are obtained for chartering ships through recognized shipbrokers in India (about 30) who are working on the panel of the Chartering Organisation, having world-wide connections with their foreign associates, representing the various international shipping centres. The cargo handled by this Organisation was of the order of 12.2 million tonnes during 1974 as compared with 8.8 million tonnes during 1973. This Organisation has earned a world-wide reputation as one of the biggest charterers in the world.

Any scheme for the expansion of Indian shipping will be unrealistic if adequate steps are not taken to ensure a regular flow of qualified personnel for manning the ships. These aspects have been duly taken into consideration and on the basis of recommendations of a special committee, namely, the Merchant Navy Officers Training Committee, set-up in 1947, the Government of India has taken responsibility for training merchant navy personnel and several steps have been taken in this direction. These include training schemes for cadets in the training ship "Dufferin" (replaced later by T.S. Rajendra) at Bombay and in the Directorate of Marine Engineering Training, Calcutta/Bombay and the Lal Bahadur Shastri Nautical Engineering College, Bombay. The three training establishments "Bhadra", "Mekhala" and "Naulakshi" provide training for ratings. The training courses in these institutions have been reoriented

with a view to providing the trainees with more intensive training and also to making them familiar with the latest developments in international shipping so as to enable the candidates passing the training institutions to keep pace with technological advancement made in ship's operation and face the keen competition from other maritime labour markets of the world. The Seamen's Employment offices at Bombay and Calcutta regulate the recruitment of seamen personnel in India and a suitable system has been evolved for recruitment on sound lines in accordance with the procedure envisaged under the Indian Merchant Shipping Act. The Government of India has also taken active steps to look after the welfare of seamen who are employed in Indian and foreign ships and to provide necessary amenities for them during their employment on the shore and also during voyages abroad. These include medical facilities, social security schemes, benevolent funds, establishment of hostels or boarding and lodging houses for seamen, clubs, canteens, libraries, educational and such other amenities for the benefit of seamen.

Maritime legislation in India has been enacted primarily with a view to serving the objectives of fostering the development and ensuring the efficient maintenance of the Indian mercantile marine in a manner best suited to the national interest. The consolidated Indian Merchant Shipping Act, 1958, contains comprehensive provisions relating to procedures for registration of Indian ships, grant of certificate of registry, rules and regulations concerning grant of certificates to masters, mates and engineers, classification and engagement of seamen, rights and privileges of seamen, safety regulations for ships, ship navigation and, above all, the regulations for the control of Indian ships engaged in the coastal trade of India. It is noteworthy that the coastal trade is entirely reserved for Indian shipping and necessary regulations have been made for the licensing of ships and fixing rates for ships engaged in the coastal trade.

Shipping is an international industry and its organization and operations are governed not only by the national laws of the States concerned but also by several International Conventions which lay down international standards in matters relating to life-saving appliances, loadline, construction, rights and liabilities of shipowners, conditions of service of seamen etc. India is a party to several International Conventions, such as the Convention on the Inter-governmental Maritime Consultative Organization (IMCO) 1958, the International Convention on Safety of Life at Sea 1960, the International Regulations for Preventing Collisions at Sea 1960, the Geneva Radio Regulations, the International Sanitary Regulations, some of the ILO Conventions concerning seamen, the International Convention for Unification of Law relating to Collisions between Vessels 1910, and the International Convention for the Prevention of Pollution of the Sea by Oil, 1954. India is also an active member of IMCO and has been participating in the conferences and seminars connected with international shipping and has also taken an active part in the sessions of the United Nations Commission on International Trade Law (UNCITRAL) and as a member of the Working Group on International

Shipping Legislation. India has also been advocating steps to be taken to assist the developing nations in maritime affairs and particularly, the concept of regional co-operation has been suggested to provide dependable liner services on the basis of a uniform and stable freight tariff simultaneously with elimination, by and large, of undesirable internal and external competition among the lines. The second session of the Preparatory Committee of UNCTAD held in Geneva in December 1973 drew up a unified text of the draft Code of Conduct for Liner Conferences. This was finally adopted in April 1974. India is yet to ratify this Convention.

The world tonnage as in July 1974 is estimated to be about 311 million GRT. The Indian shipping fleet is today 17th largest in the world with tonnage of 3.64 million GRT which represents 1.17 per cent of the world tonnage. It is the largest among the developing countries but the status that Indian shipping enjoys in the world is even higher because it is realized that India has the requisite capability for developing into a major maritime nation. India has the necessary commercial and technical expertise in manning and operating a very diversified and modern fleet comprising cargo liners, passenger ships, tankers, ore-bulk-oil carriers etc. It can be claimed that so far Indian shipping has developed on right lines. Its growth has been fairly rapid, it has diversified and modernized its structure, it is internationally competitive and it has acquired an inherent strength so that it is in a position to forge ahead. Indian merchant navy officers and sailors have a well-established reputation for dedication to duty and efficiency. The country has a big opportunity ahead, because the world's modern fleet is bound to expand in the future at an accelerated pace and India can participate in this expansion to an increasing extent.

3. INDONESIA

Introduction:

a. Geographical position:

Indonesia is an island nation consisting of 13,667 islands which are lying around the equator between 94°15' West and 141°05' East Longitude and 6°08' North Latitude and 11°55' South Latitude.

About 1/3 of this region (735,581 square miles) consists of land while about 2/3 consist of waters. About 992 islands are inhabited and 12,675 islands are uninhabited. The Indonesian population is estimated at over 120 million.

Indonesia lies between Asia and Australia and also between two oceans, the South Pacific and the Indian Ocean, lying at the world trade junction of sea transport, while there are no geographical boundaries overland with other nations, it follows that shipping is a vital element for this nation as practically all trade with foreign countries has to be done through sea transportation whereby the waters and the straits are the main roads for the integrated development of the economy, political, social and culture development. This country has tremendous potential of natural sources and energy as well as agriculture; for mineral products the most important

are oil, tin, bauxite, manganese, iron sand, nickel, iron ore, copper, coal, natural gas, etc., and also as a producer of agricultural raw materials, such as rubber, coffee, palm oil, copra, logs, tea, tobacco etc. which all together would require shipping space for the transport to world-wide markets as well as for domestic industries. On the other hand all domestic requirements of imports, which are fertilizers, cement, rice, wheat, cotton, construction equipment, have to be carried by sea to reach Indonesia.

Today the total volume of domestic sea transport reaches 20.2 million tons of cargo (including oil/oil products 13 million), while seaborne foreign trade reaches 60.2 million ton (oil/oil products 57 million).

b. Government policy for sea transportation:

From past experience during the first Five-Year Development Plan and at the beginning of the second Five-Year Development Plan, and especially so from the history of the development of the social, political, and cultural as well as security and defense of Indonesia, it is evident that the sea transportation function for our country has been a strategic key of vital importance, to support the development of the united political and economy development to integrate the island nation as well as to develop and spread the increase of living standards of this island nation. In order to fulfil and develop this island nation policy, the development of the infrastructure of sea transportation has been divided into a long-range and a short-range target as follows:

Long-term target

The sea transportation policy is directed to the creation of a condition to own a merchant fleet under the Indonesian flag, manned by Indonesians, developed and maintained by national shipyards, developed by national capital and in sufficient quantities to serve the domestic sea transportation demand as well as part of the international trade.

1. The type and size of vessels with its equipment would have to be adjusted to the cargo carried and would be subject to technological progress.
2. The area to be covered would have to be scheduled in such a way that every port could be called upon.
3. The above policy and scheduling shall cover the sea transportation activity for the ocean-going, inter-island, local sea transport and sailing vessels whereby each route system is interrelated to other routes and they supplement or complement each other. It shall not be only a system of sea transportation by itself but would be a system which integrates sea and the land transportation as well as air transport and inland waterways transportation, with freight tariffs which can be borne by the living standards of people.
4. The various organizations, by management or structure, whether a governmental enterprise or private enterprises should be controlled by the Government in order that the national integrity can be reached. Therefore, in time of peace,

the infrastructure of sea transportation shall be the support for development in the field of agriculture, industry, trade, and tourism as well as to support the Governmental Administration.

Although the above targets are still far-reaching, the basic foundations have to be laid down in this second Five-Year Development Plan, at least by way of the policy for the provision of the physical infrastructure, the organization of requirements, as well as the regulations and conditions to organize it.

Short-term target:

The second Five-Year Development Plan which in fact would be a process in the framework of the long-term target, the use of funds and forces which are obtained from national resources, would have to be adjusted to the priority scaling which is urgent, especially geared to serve the development of industry, agriculture, forestry, mining and the increase of the trade flow which, all together, would reach their peak sometime in 1976-1977.

c. Port conditions:

The total number of Indonesian ports is 649.

1. By ports we would emphasize the following details:

— 562 ports are not yet developed and 87 ports are developed into main and out-ports.

2. A sea port is defined as an open sea port for foreign trade and a coastal port as a port closed to foreign trade, and the figures shows as follows:

— 52 sea ports.

— 597 coastal ports. From the above figures 137 coastal and sea ports are serviced regularly by the fleet of vessels within the regular liner service routes.

3. Apart from the above, we also have special coastal ports which means ports which are open for exporting certain cargoes:

— 406 for logs,

35 for oil and natural gas,

9 for industry,

9 for cattle and

5 for forestry products.

Prior and after calling at a special coastal port, a vessel would have to call at the nearest sea port, for inward and outward foreign trade clearance, for which 62 checking points are established for logs.

At present no special port for container vessels has been built with the required and modern facilities although the biggest port in Indonesia which is Tg. Priok is already receiving a number of standard containers carried by conventional vessels.

d. The shipping system:

Sea transport in Indonesia has been divided into 5 categories of activities by regulations according to the need of the transport:

1. Ocean-going shipping is an activity for the purpose of sea transport for cargoes for foreign

trade, which function is to support the international trade whereby the type and size of vessels are different, adjusted to the sea transport requirement according to the operational purposes.

2. Inter-island shipping is a sea transport activity for the purpose of carrying cargoes and passengers between the islands within the Indonesian territory and is functioning as a feeder-line for the ocean-going shipping fleet.
3. Local shipping is a sea transport activity which is limited to a range of about 500 miles from its main base by using vessels with a size under 175 gross ton which function as coaster liners to accumulate cargoes for inter-island shipping as well as developing the economy and trade in its domicile province.
4. Sailing vessels using wind sails is a sea transport activity that functions as a supplement of the inter-island and local shipping.
5. Apart from the above types of sea transport activities there is also a sea transport activity which is called "Special Shipping" and comprises the transport of cargoes with specific qualities e.g. crude oils and minerals, logs and industrial products or bulk cargoes whose transportation requires special vessels and its operation covers domestic as well as overseas trade.
6. Apart from the above sea transport activities, for the weak areas, the Government has provided Pioneer Shipping with Governmental vessels without calculating profit or losses. The purpose of this Pioneer Shipping is to develop remote areas into developing centres of economy, social and governmental administration in order that inter-island policy can be reflected in these development centres. As soon as these weak areas begin to develop due to this Pioneer Shipping, the vessels will be withdrawn and its role taken over by the inter-island merchant fleet.
7. The Indonesian fleet in 1973 was:
 - a. Inter-island:
262 vessels = 262,862 DWT
 - b. Local shipping:
980 vessels = 92,619 BRT
 - c. Sailing ships:
460 vessels = 36,000 BRT
 - d. Ocean-going:
47 vessels = 438,930 DWT (including special passenger ships for Haji)
 - e. Special shipping:
Ocean-going:
45 vessels = 1,143,236 DWT
 2. Domestic:
118 tankers = 525,716 DWT

I. The Operation and Management of Public and Private Shipping Service

1. Conforming to the conditions of cargo carriage and the range of sailings, the shipping activity is

organized into several factors as follows:

- (1) Ocean-going shipping for sea transportation serving foreign trade.
 - (2) Inter-island shipping for domestic inter-island shipping and organized into a regular liner service.
 - (3) Local shipping/sailing vessels for inter-island shipping within a limited range.
 - (4) Special shipping to carry special cargoes (bulk products) for foreign trade as well as domestic inter-island trade.
2. Of all those shipping companies there are only three state enterprises.
- (1) The ocean-going shipping Djakarta Lloyd for the international operations.
 - (2) Inter-island shipping PELNI for the domestic operations within R.L.S.
 - (3) Inter-island shipping Bahtera Adhiguna, for the operations of bulk cargoes.
3. The development of sea transportation has been emphasized in the inter-island shipping or regular liner service. This is based on the principle of cabotage and also due to the all-important factor in the smooth cargo flow which is supporting the national economy in general. Development of ocean-going shipping is to reach the 50 per cent target of the volume of the import export of Indonesia. The exception is the transportation of logs and oil as main product and which has the most important trade with foreign countries where national shares has not reached 10 per cent of the present volume.
4. Within the context to accommodate national aspirations to develop sea transportation services by the national fleet, the Government has taken the following steps:
- (1) Regulating the national inter-island route for all ports in Indonesia.
 - (2) The establishment of a tariff structure in order that national shipping companies can be developed without governmental subsidies.
 - (3) The establishment of the Indonesian Shipowners Association.
 - (4) The establishment of the Inter-island Body for Operation, Indonesian National Lines and the Body to Coordinate Operations of Special Shipping respectively consisting of joint operation bodies of inter-island shipping, ocean-going shipping and special shipping comprising private and Government enterprises.
 - (5) To upgrade the management by giving technical assistance aid.
 - (6) The rehabilitation of the fleet.
 - (7) The reorganization of shipping companies merged into operational groups.
 - (8) The establishment of P.T. PANN (Development of National Fleet) to channel Governmental assistance of credits with low interest rate of about 10 per cent p.a.
 - (9) For remote areas where those outports would not have sufficient cargoes and therefore would not be commercially feasible for vessels, the Government is establishing state Pioneer Shipp-

ing whose operational losses are borne by the Government.

- (10) The approach to shippers and consignees as far as possible in order to secure that important cargo movements from and to Indonesia are carried out by the national fleet.
- (11) The creation of flexibility of activities for shipping companies in order to cover the cargo handling in ports, operating of go-downs, warehousing and agencies of foreign vessels in order that these earnings could assist the development of national shipping companies and therefore offset any negative liquidity by freight earnings only.

II. Operation of Liner and Non-Liner Service

a. For ocean-going shipping, Indonesia is utilizing 50 vessels with a total tonnage of 451,709 DWT comprising 6 companies. Compared with 10 years ago, the increase in tonnage is 99 per cent, increase of vessels 72 per cent. The increase of the above is a progressive development if we take into account the problems and the difficulties to increase the shipping assets.

Further development of ocean-going shipping will face an interesting challenge owing to the introduction of the modern technology such as container and lash which need bigger financial investment etc. The Government is planning to phase out this development as practically as possible, taking into account the average age of the fleet. A study has been initiated to consider the choice of a multipurpose carrier for the coming investment in ocean-going vessels.

Conforming to the present trade pattern with Indonesia, the national fleet has been put in the sailing routes according to DWT average per vessel, with average speed and round trips per annum.

Destination	Average DWT	Speed	Round trip per annum
Indonesia - Europe	11,000	12 - 15	2
Indonesia - USA	12,000	12 - 16	2
Indonesia - Japan	10,000	12 - 15	4
Indonesia - Australia	6,000	12 - 14	4

Vessels with USA and Europe as destination will call at main and outports of Indonesia averaging between 5 and 7 ports per voyage for discharge and loading of export cargo which would need between 35 and 40 days from arrival at first port to last port prior leaving Indonesia, whereas the voyage from Indonesia to USA or Europe would take about 55-60 days; thereafter the remaining time would be required to make the round trips in the USA or Europe including repairs and maintenance.

On the other hand, vessels with Japan as destination would call at 3 or 4 ports in Indonesia requiring about 30 days and vessels with Australia as destination would call at only 2 or 3 ports in Indonesia requiring about 10 days only.

The policy on operating sea transportation has been regulated by the Government in Reg. No. 2, 1969 for domestic as well as ocean transportation, to be executed as far as possible according to a liner system.

In order to comply with the above policy the

ocean-going companies have come together and created a joint operation called Indonesian National Lines to co-ordinate the voyages of their fleet. In the meantime, in order to obtain a fair cargo share available at each trade destination, Government support is required for membership of INL for each conference in Indonesia which include the Indonesian Europe and Europe Indonesian Freight Conference, the Indonesia Japan and Japan Indonesian Freight Conference, the Deli New York Rate Agreement and the Java New York Rate Agreement.

- a. To reduce dependency of the Indonesian foreign trade on foreign vessels.
- b. To guarantee the creation of a tariff level acceptable to shipping practices, which stabilized rates over a certain period of time would be required to develop the foreign trade in Indonesia in order to support the economical development.
- c. To reduce the deficit in foreign trade payments in Indonesia by freight earnings earned by the national fleet.

It is for this reason that the Government has decided on a policy which integrates and co-ordinates all aspects of the economy, such as trade, industry, agriculture, and sea transportation, in order to support the development of the national economy by the name of the "5 year national economic development plan". For the past 5 years, the general cargoes carried by our fleet on a liner basis within the Conferences for Indonesia USA, Indonesia Europe, Indonesia Japan and Indonesia Australia have shown an annual increase.

For 1972 the total tonnage reached 3,181,302 tons compared with 4,441,138 tons in 1973 which is an increase of 39.5 per cent or 1,259,836 tons and 5,384,849 tons in 1974 which means another increase of 21.25 per cent or 943,711 tons. But the cargo share carried by INL vessels remains the same small figure which is 1,031,078 tons in 1972 or 31.8 per cent of the total carried by the Conference vessels, and in 1973 reached 1,372,816 tons or 30.7 per cent which is a decrease of 1.1 per cent and in 1974 a total of 1,575,993 or 29.2 per cent or a decrease of 1.5 per cent. The main reason for this decrease is that the vessels operated by INL consist of old vessels which require more time for repairs, while the total tonnage of vessels used has no changes by unit or type. On the other hand the cargo share carried by foreign liner vessels is increasing by 1.5 per cent each year whereby the total tonnage carried by Conference liners of INL and NIL increases by 30 per cent on average every year which means it would increase the deficit in our balance of trade payments. The above also means that the development of the Indonesian ocean-going fleet has been retarded compared with the increase in foreign trade volume.

b. For inter-island shipping, Indonesia utilized 304 vessels with a total tonnage of 301,607 DWT comprising 44 companies. Compared with 5 years ago, we find a decrease in tonnage by 26 per cent, in vessels by 21 per cent and in companies by 17 per cent. The above was due to a rationalization in shipping policy whereby smaller-size vessels have been withdrawn from the regular

liner service to local shipping.

The nomination of vessels in this inter-island system on a liner and regular basis is to execute the basic concept of arriving at a stabilized level between availability of shipping space and requirement of shipping transportation which should support the 5 year plan and national economy at present, therefore it would require a continuous effort to perfect the traject system in accordance to the development by time. For the past 5 years we have noted an increase in cargo movement of 10 per cent p.a. or 2,784,000 tons in 1974.

This RLS system has been supplemented with the operations of the non-RLS fleet within the tonnage limitations and specific vessels for each route which change according to seasonal crops.

III. Maritime Legislation:

To regulate the merchant fleet, Indonesia is still using the Indische Scheepvaart Wet 1936, the Maritime Law or shipping regulations during the colonial period of the Dutch. Pending the process of changing the out-of-date Laws into an up-to-date Merchant Marine Law, the Government has several times supplemented with Governmental regulations in order to regulate the shipping policy in Indonesia according to situations and conditions at present.

Lastly the Government has issued Governmental Regulations No. 2, 1969 for establishing and operating sea transportation. The digest of this regulation is as follows: 1. That the Indonesian Government in regulating and developing domestic sea transportation shall basically follow the cabotage principle, i.e. the protection of national shipping against foreign flags. This means that the right of domestic sailings shall not be given to foreign flags.

2. For foreign trade shipping, Indonesia follows the principle of fair share cargo sharing for exports as well as imports.

IV. Co-operation with Other Countries of the Region:

The co-operation with countries within the South East Asia frame can be divided into a multilateral and bilateral basis. In the multilateral frame is meant within the framework of ASEAN which has been laid down in an Agreement of the 5 member nations which are Indonesia, Singapore, Malaysia, Thailand and Philipines.

In order to guarantee the continuity of the execution by stages and the development of the co-ordinating projects, it has been agreed to establish a standing committee on shipping which is holding meetings from time to time on a regular basis. This co-operation has been in the spirit of the ASEAN family frame for the mutual benefit of its nation members, which reflects in another wider scope among nations. The most important part of this co-operation has been realized more clearly by other nations, i.e. that the island nations would have their proper rights on their own water including the demand for territorial waters, the limitations of the continental shelf and the right to regulate shipping in

the Straits of Malacca.

The same could be said of the "Code of Conduct of Liner Conferences" i.e. the declaration of cargo sharing on the basis of 40-20-40 per cent among three groups i.e. 40 per cent for each nation directly involved with trade and 20 per cent for the third party with non-direct involvement. The other results are the exchange of information and regulations for the merchant marine shipping for various fields including discussions about these matters between the experts of the member nations. For this purpose there have been established:

1. "Expert Group on Shipping Statistics/data" which is located in Bangkok, Thailand, and which has the duty of collection and Dissemination of shipping statistics information/data.

2. "Expert Group on Bulk Shipping" located in Penang, Malaysia, whose activity is a study on bulk shipping.

3. "Expert Group on Containerization" located in Singapore, which is investigating the feasibility of containerization among ASEAN members.

4. "Expert Group on Marine Pollution" located in Manila, Philippines, whose activity is to co-ordinate the prevention and combating of marine pollution.

5. The Expert Group on S.A.R., located in Jakarta, Indonesia, has been able to draft an agreement on Marine Search and Rescue Co-operation which has been proposed to the higher levels of the Governments for consideration and approval prior to an exchange of signing and ratification.

In the framework of bilateral co-operation, separate Agreements have been made in Marine Shipping between Indonesia and neighbour nations within the spirit of ASEAN. Between Indonesia and Singapore, several meetings have been held between the Singapore Shipping Association (S.S.A.) and the Indonesian Shipowners Association to reach a fair cargo share principle for mutual benefit and reasonable freight tariffs as well as conditions of transportation, regularity of vessels to each destination, and the direction has been to establish a secretariat for the joint Indonesia Singapore Shipping.

4. IRAN

According to the latest statistics, the total amount of imported goods was 6.5 million tons and that of exported goods was 2.5 million tons in 1973/74, with 5.5 million tons and 1.5 million tons, respectively, handled through our operating ports. These figures show the importance of merchant shipping in connection with the trade of Iran. Imported and exported goods are handled through the seven ports of Khorramshahr, Shahpour, Bushire, Abbas, Abadan, Pahlavi and Nowshahr. Annex I gives details of six of these ports.

According to our statistics, 2,175 vessels of total gross registered tonnage of 12,370,000 called at Iranian ports during 1973/74. Of these, 460 of 1,286,000 total gross registered tonnage were under the Iranian flag and they transported over 400,000 tons of cargo to and from different ports of the world.

Total imports and exports have increased to 10 million tons during the year 1974/75, and it is forecast

that the figure will rise to 11 million tons in 1975/76. Annex II shows the total tonnage handled by each of the seven ports in the years 1973/74 and 1974/75. Annex III is the list of shipping companies in Iran. In addition, there are about 2,500 vessels, each of approximately 100 tons, assigned to the coastal navigation service for the southern ports of Iran.

Annex I
IRANIAN PORTS CONDITION

Ports Installations	Khorramshahr	Shahpour	Abbas	Bushire	Pahlavi	Noshahr
Number of jetties	9	6	6	2	4	2
Overall length of jetties (m)	1,360	1,052	1,050	342	510	250
Depth in L. L. W beside jetties (m)	7to10	9to10	9.5to10.5	9.5	4.4to5.7	4to5.1
Overall length of jetties allocated for barges (m)	1,115	300	-	150	-	-
Number of stores	19	19	5	16	13	6
Area of stores (m ²)	90,000	26,000	28,000	5,000	11,000	6,000
Open areas (m ²)	446,000	111,000	16,000	10,000	57,000	12,000

Annex II
COMPARATIVE STATISTICS OF OPERATION
THROUGH COMMERCIAL PORTS.
(in thousand tons)

Port	Imports		Exports		Total cargo handled	
	1973/74 ^{a/}	1974/75 ^{b/}	1973/74 ^{a/}	1974/75 ^{b/}	1973/74 ^{a/}	1974/75 ^{b/}
Khorramshahr	2,123.5	2,556.2	474.3	435.9	2,597.8	3,032.1
Shahpour	1,885.3	2,668.0	361.9	363.9	2,247.2	3,031.9
Abadan	249.7	501.0	51.6	57.3	301.3	558.3
Abbas	356.3	1,101.4	193.4	192.7	549.7	1,294.1
Bushire	92.3	323.1	23.4	29.4	115.7	352.4
Pahlavi	277.5	308.6	92.1	93.4	369.6	402.0
Noshahr	105.6	110.8	49.0	15.5	154.6	126.3
Total	5,090.2	7,609.1	1,245.7	1,188.1	6,335.9	8,797.1

a/ 21/3/73 - 20/3/74 (twelve months).

b/ 21/3/74 - 20/2/75 (eleven months).

Annex III LIST OF IRANIAN SHIPPING COMPANIES

1. Arya National Shipping Line.
2. Gulf Shipping.
3. Pers Express.
4. Express Service.
5. Daryanavardi (Maritime).
6. Noah Shipping Co.
7. South Shipping Line.
8. Caroun.
9. Basco.
10. Bonyad Pahlavi.
11. Haryram Seberval and Son.
12. Doraghi Brothers.
13. Maritime Services.
14. Yumus Shipping Co.
15. Sai Shipping Co.
16. Alco Shipping.
17. Iran Cargo.
18. Iran and German Shipping Co.
19. Iran Cargoah.

5. KHMER REPUBLIC^{L/}

Introduction

Despite the great availability of roads and railways, the navigation in the Khmer Republic has always played a predominant role for the prosperity and development of the national economy. But there was no remarkable progress in foreign trade shipping. The coastal fleet however has now become a necessary instrument for linking coastal provinces.

Shipping is one of the few industries guided by a set of international rules, by various conventions and established practices-ship's documents, shipping forms must be uniformly used by all maritime countries. However, the English language is accepted as the lingua Franca in commercial and technical operations of ships around the world, particularly in the ESCAP region.

By contrast, the Khmer Republic with the handicap of the English language (we speak French as a second language) cannot easily obtain the benefits of economy through the shipping industry.

Current Shipping Situation

The Khmer Republic never had a modern merchant fleet and was not, up to now, particularly prepared for it. The remaining three ships owned by private companies were sold to foreigners. More than 15 private shipping companies are registered in the Khmer Republic but they are only engaged in ship agencies.

The Khmer Republic is actually under the war situation, the Mekong River is still obstructed and no ship can reach the port of Phnom Penh. Previously we could organize three convoys a month from the sea to Phom Penh.

Speaking about the seaport of Kompong Som, the same difficulties are noted because the Highway 4 linking the port to the capital has also been obstructed since October 1973.

The volume of sea-borne trade has been decreasing as shown by the following statistics of the two main ports.

Traffic of Kompong Som port (tons)

1970	736,927
1971	223,348
1972	95,574
1973	187,372
1974	23,714

Traffic of Phnom Penh port (tons)

1970	54,022
1971	307,687
1972	416,101
1973	420,142
1974	130,544

Maritime Legislation

It is essential to recall the background as follow: The treaty of 1863 placed Cambodia under French

^{L/} Now Cambodia

protection. In 1884 under a new treaty, two parallel administrations were set up, one Cambodian and the other French. In 1887 Cambodia was included in the Indochinese Union. During this period the French legal system was introduced in Cambodia and several enactments dealing with the inland and maritime navigation were promulgated. In 1947, exactly when the first constitution of Cambodia was promulgated, *modus vivendi* was recognized. These texts are still in force in the Khmer Republic except for certain cases amended by later legislations. After this period very few legal texts relating to navigation, especially to maritime navigation, were promulgated by the Khmer Government.

The Khmer Republic adheres to the following conventions:

- International Convention for the Safety of Life at Sea, 1960
- International Regulation for Preventing Collisions at Sea, 1960.

Khmer Republic's Efforts for the Development of Shipping

In the institutional reform, the Khmer Government included the programme of setting up a shipping company which can ensure not only the inland connections but also the feeder services which move cargo to and from foreign ports.

According to the Investment Law, all foreign shipping firms could receive large opportunities and advantages to invest in the Khmer Republic. The programme for the creation of a free zone is being actively implemented. The Kompong Som port is being extended to be able to accommodate 24 ships instead of 4 as now, and the Phnom Penh port to be able to unload 60,000 tons per month instead of 35,000 tons as now.

6. MALAYSIA

I. Current Shipping Situation in Malaysia

Despite technological advances in other means of transport, ocean transport by ship remains the major means of carrying world trade. This is true not only in the case where trade is considered in terms of volume, but also in terms of value although to a lesser extent. Although ocean shipping services are supplied mainly by the traditional maritime nations of the developed world, but the cargo flow in world trade largely originates in the developing countries which supply the developed countries with oil, minerals and essential primary agricultural products.

The is also the case with Malaysia, a developing country, who largely depends on the maritime nations' shipping services to export her agricultural products like rubber, latex, palm oil, timber and timber products. Besides, Malaysia's agricultural exports, which constitute about 80% of her total export are also mainly directed to the developed areas in the world of which the four main destination areas are:-

Western Europe	- 25.5%
Japan	- 17.3%
United States	- 13.8%
Singapore	- 23.2%

These four areas together take about 80% of our exports. However, in terms of shipping, the trade with Europe is the most important as all of our exports to Singapore are carried by land. Almost all our exports to Singapore are being re-exported mainly to the above three destination areas. These various trade routes are served by many Shipping Lines some of which have grouped together to form association or "Conferences" which are often monopolistic in nature. Besides these Conference Lines there are other Shipping Lines which operate independently but on an irregular basis.

High freight rates and the unilateral nature of imposing freight increases by the Conferences can be considered as one of the main problems that are facing the Malaysian shippers. In 1974, for example, significant general freight increases have been imposed by a number of Conferences serving our important trade routes of which the increase by FEFC of 18% to be effective on 1.1.1975 top the list. These increases have adversely affected our major export commodities like rubber (sawn timber exempted) which is a bulky and relatively low value cargo. The freight increases have not only reduced the returns received by our producers but also made the products less competitive. With the freight going up and prices going down the percentage of freight payable to FOB prices of our main exports has increased substantially. In the case of rubber, the proportion of freight element in the FOB prices of RSS No. 1 rubber to Europe has increased from 5.9% in 1973 to 6.9% in March 1974. With the present freight increase of 18% by the FEFC the proportion would increase to about 10%.

The second problem facing our shippers is the lack of adequate space available for our exports to certain destinations. The inadequacy of shipping services from Straits ports to countries in West Asia has been singled out as one of the biggest obstacles to the promotion and expansion of trade to the West Asian countries. This has frustrated Malaysian shippers particularly at a time when the Government is trying hard to promote and expand Malaysia's trade with this part of the world. The lack of adequate shipping services to the West Asian countries is due to the absence of sufficient cargo to induce ships going to West Asia to call at our ports and the lack of return cargoes. In view of the importance being given to this area by the Government, efforts are being made to set up a Freight Booking Centre to cater initially for the West Asian trade. It is hoped that as the amount of cargo going to this area increases, more ships would be attracted to call at our ports.

The other problem faced by shippers is due to the nature of some of our cargoes e.g. timber which are not only bulky in nature but being of low value can stand relatively low freight rate. As a result of this low freight rate vessels often refuse to carry the timber cargo especially during the period of boom as happened last year.

The most immediate concern of the Malaysian

Government however was to ensure that shipping services are facilitating the flow of trade (especially of exports) and not restraining it by reason of high freights or inadequate services. With these aims in mind the National shippers' Council was set up on a protem basis in November 1972 with the aim of bringing together shippers, exporters and producers into a united body so that collectively they can promote and protect their interests in relation to the transportation of our cargoes abroad. With the establishment of the Council, a machinery was set up whereby consultation could be held on matters affecting the interest of shippers and Shipping Lines. These matters include freight rates, efficiency, and the adequacy of shipping services for our trade. With the present system, the Conference can no longer increase their freight without prior consultation with the Shippers' Council.

Other measures taken by the Government to combat freight increases to explore alternative means of shipping which are more suitable and economical for our trades. Studies have shown that the existing Conference services are not suitable for our trades as most of our cargoes are bulky and relatively low value items like rubber, palm oil and timber. They could be shipped more economically in bulk using chartered vessels. In this way they would be able to cut costs and hence reduce freight rates. This has been done in the case of palm oil and found to be very successful. The Government is now in the process of studying the system of bulky shipment for rubber and timber. This method, however, requires greater organization among exporters and shippers so that the goods can be grouped together in large quantities instead of being shipped in small amounts as it is done now.

Another step which has been taken by the Government to minimise the shipping problems is the launching of the National Line i.e. Malaysian International Shipping Corporation (MISC) in 1968. The participation of Malaysian flag vessels will help save foreign exchange besides providing a service to our shippers. MISC with her fleet of 16 vessels totalling approximately 420,000 DWT is offering a variety of services including liner and bulk mainly to the Malaysia/Europe trade and also the intercoastal trade. As the majority of shippers in the Malaysia/Europe trade, and almost all the shippers in the Europe/Malaysia trade, are FEFC signatories, MISC has no alternative but to join the FEFC in order to gain access to cargo to and from Europe.

MISC is also participating actively in the transportation of goods between Sabah, Sarawak and Peninsular Malaysia. It is also the Government's intention to allow the National Shipping Line to play a dominant role in this trade. Besides MISC there are 3 other foreign shipping lines serving the coastal trades.

Port facilities have a direct bearing on shipping and poor port conditions may lead to the imposition of surcharge which will lead indirectly to the increase of the gross freight payable. Poor port conditions also may deter ship owners from scheduling into a port the number of vessels which merchants use to meet their space requirements for all destinations. Bearing these factors in mind, the authorities in Port Kelang and

Penang the two major ports in Malaysia have undertaken several projects and installed modern facilities to minimise the congestion problems and increase productivity. An additional two new ports are being built in Johore and Pahang to cater for the increasing trade from these regions. It is expected that these two new ports will handle Malaysia's bulk exports i.e. timber and palm oil and thus alleviate the pressure on Port Kelang and Penang.

Containerisation has not resulted in immediate benefit to Malaysian shippers in the form of freight rates. The more bulky and low value Malaysian cargoes like timber and rubber may not be good for containerization although other Malaysian cargoes especially the manufactured products lend themselves well to containerization.

II. Operation and Management of Public and Private Shipping

The sole Malaysian flag carrier which is operating at the present time and which is likely to operate in the foreseeable future, is the Malaysian International Shipping Corporation (better known as MISC), which is owned partly by the Government (as majority shareholder) and partly by private interest. MISC came into being on 6th November, 1968, mainly to look after the interest of our Malaysian shippers, who has been too dependent on foreign lines to carry their enormous quantities of goods. It was also felt that a national line offering a competitive service alongside the established liners was urgently desirable.

MISC who initially started off as a general cargo company with vessels equipped with facilities for conventional cargo is now a proud owner of 16 vessels totalling to 420,000 DWT including bulk carriers and tankers. Although MISC trade mainly concentrate in the Europe trade but also play a dominant role in providing domestic services from Peninsular Malaysia to Sabah and Sarawak. As the majority of shippers in the Malaysia/Europe and Europe/Malaysia Trade are FEFC signatories, the company has no practical alternative in the liner trade to joining the FEFC in order to gain access to cargo. As a member of FEFC it is committed to follow FEFC policy in all matters including freight increases.

MISC had to struggle to obtain a satisfactory share of the cargo, and is not contended with the existing share. The same question arises in the non-liner section of the Europe trade which ought to be carrying the bulk of Malaysia's export to Europe. However in principle, the Government has decided that Malaysian flag vessels should carry 40% of the export of palm oil and MISC is in the process of building three parcel tankers which would be suitable for palm oil carriage. A certain amount of conflict is inevitable between the cargo owners in minimizing the general level of freight rates and the interest of national shipping lines in maximizing their profit. With the assistance of the Government, the interest of cargo owners and the interest of national shipping line were harmonized for the benefit of both parties.

Besides MISC, Gaya Shipping and Great Malaysia Line are the two private Shipping Companies presently

operating in Malaysia. Although the former company has two vessels, it is partly owned by MISC, and it operates on a service from Sabah to East Malaysia and to Japan carrying woodchips mainly. Great Malaysia Line on the other hand owns two passenger liners which are normally on contract with the Malaysia Pilgrims Fund Board to carry passengers on their pilgrim voyage to Jeddah for 5 months in a year but for the rest of the year i.e. 7 months, the ships operate cruises in Australia.

Perkapalan Kris is the other coastal company which provide services for the carriage of liquid cargo between Malaysian ports. Small vessels owned by this company call at palm oil estates to receive small parcels of 500 tons for discharge into tanks at ocean ports. Fuel oil and gas oil are carried from refineries to riverine ports for redistribution by roads.

III. Operation of Liner and Non-Liner Services

Malaysia's trade is served by conference lines, non-conference lines and contract carriers. All together there are no less than twenty shipping conferences covering the trade between the various parts of the world and Peninsular Malaysia, Sabah and Sarawak. Chartering activities here have not gained much popularity and are minimal. Although some bulk carriers are in service, these are also operated on a liner basis (both by Conference and non-Conference) rather than on the charter or contract basis which should normally apply for the carriage of bulk commodities. Apart from the palm oil carriers, which are on a contract basis, the non-conference operators and their activities are as follows:-

- | | |
|--|---|
| (i) Odessa Ocean Line (USSR) | Basically engaged in carrying national cargoes but engaging |
| (ii) Navigation Maritime Bulgars (Bulgarian) | in a certain amount on route. Operating on liner terms. |
| (iii) China Ocean Shipping Agency (Chinese) | |
| (iv) Steelwood carriers Inc (Retla) | Round the world bulk carrier service, lifting limited amounts of timber from Malaysia on liner terms. |
| (v) Marasia S.A. (Spanish) | Liner service to Spain |
| (vi) Scindia (Indian) | Liner service to Mediterranean. |

Studies undertaken by the Shipping and Freight Study Unit on the Malaysia/Europe and Malaysia/Japan trade shows that cargo moving from the Straits ports to Europe are being shipped by a variety of methods, as shown in the table below, in relation to the various categories of cargo.

Methods of Shipment From Straits Ports To Europe

Method of shipment	Palm oil from Straits	Rubber from Malaysia	Latex from Straits	Timber plywood from Straits	Balance from Malaysia
Conference liners	Nil	95%	100%	28%	Almost 100%
Non-conference liners	Nil	5%	Nil	Est. 62%	Negligible
Charters	Nil	Nil	Nil	Est. 10%	Nil
Contract	100%	Nil	Nil	Nil	Nil

As for the Europe/Malaysia cargo, only limited quantities of cargo (mainly fertilizers and chemicals) are moving by charter, otherwise there appears to be practically no non-conference activity at all.

At present palm oil is the only commodity that is moving on a contract basis. Formerly it was carried exclusively in the deep tanks of FEFC liner vessels, but in 1972 the industry switched from conventional liner shipping to contract shipping-mainly by parcel tanker. The Malaysian Palm Oil Producers Association (MPOPA) which acts as co-ordinator for all the exporters, decided to split the proposed contract arrangements in order to avoid placing the entire volume in the hands of a single operation or group of operators. MPOPA has also concluded arrangements so that the two separate contracts signed - one with FEFC operators, and the other with the Stolt Nielsen group of companies which operates outside the FEFC. Both contracts however make allowance for certain tonnages to be allocated to MISC, the national flag carrier. As a result of these arrangements about 80% of palm oil is now being carried on a contract basis with the remaining 20% being carried in the deep tanks of FEFC liners.

As for rubber, the non-conference shipments are being made through the Malaysian Rubber Exchange and Licensing Board (MRELB), which co-ordinates bookings of all non-conference bookings, and arranges for space on Chinese vessels. These shipments are operating on a general non-conference liner basis. Studies are also undertaken now to promote the shipment of rubber by bulk as it is found to be more economical.

Timber is however being carried mainly by Retla Steamship Company which broke up the traditional pattern of shipments in September, 1971, by entering the trade with bulk carriers and using bulk methods for the first time. As for charters, they only account for a small tonnage, and they operate from Singapore.

From the study undertaken on the Malaysia/Japan trade it shows that trade is mainly done by charter or contract arrangements which cover all the shipments of palm oil, bauxite, iron ore, wood-chips or logs. Charters are also used for part of the ilmenite ore shipment, and for occasional shipments of sawn timber. The balance is lifted by liner services. As for trade from Japan to West Malaysia it is being carried almost entirely by liners, either conference or non-conference.

IV. Maritime Legislation

Merchant Shipping Act

Shipping activities in Malaysia will be governed by

Legislation called the Merchant Shipping Act which is in the process of drafting and will be passed soon. Among the important provisions of this Act are those concerning the registration of Malaysian ships. Under this Act, a ship shall only be regarded as a Malaysian ship when the majority of the share capital is held by citizens of Malaysia. The next important provision is regarding the control of Malaysian ships and ships engaged in the domestic trade. No ship other than a Malaysian ship or a ship chartered by a citizen of Malaysia shall engage in the 'domestic trade' of Malaysia. Domestic trade here means the trade between ports in East Malaysia and between ports in East and West Malaysia. Under this Act, there is also a provision which states that the Minister may, by order in the official gazette, fix in the prescribed manner the rates which may be charged for the carriage of cargo or passengers by any ship engaged in this domestic trade and that no owner or agent of a ship shall charge rates exceeding the fixed rates.

Code of Conduct of Liner Conferences

The Malaysian Government is considering signing the Convention on the Code of Conduct for Liner Conferences, which has been adopted by the United Nations Conference on Trade and Development (UNCTAD). The implementation of the Code will form the basis for an internationally recognized procedure for consultation between shippers and shipowners on matters of mutual interest. The Code, it is hoped, will enable our shipping line to have a bigger share of carriage of our exports and imports on the main trade routes.

V. Co-operation with other countries of the region and other related facilities

ASEAN

Regional co-operation among the ASEAN countries in shipping is being promoted through the ASEAN Permanent Committee of Shipping. This Committee was established in 1969 with the objective of promoting co-operation among member countries in the field of maritime activities. These activities include navigation, ports, national shipping lines, training of shipping personnel and freight rates. With the co-operation amongst shippers in the ASEAN member countries it could help to improve their bargaining position so as to enable them to secure more advantageous rates and services from shipping conferences and other shipments.

Realizing that the work of this committee has come to a stage where general discussions have ended and that technicalities of implementing projects have to be closely studied and recommendation of workable measures work, several Expert groups were set up at the technical level, which will meet oftener than the just once a year meeting of the committee. The Expert Groups that were set up were as follows:-

- (1) Expert Group on Bulk Shipping
- (2) Expert Group on Containerization
- (3) Expert Group on Shipping Information and Statistics.

(1) Expert Group on Bulk Shipping

The aim of setting up this Expert Group is to explore the feasibility of introducing bulk shipping among the ASEAN member countries, as a means to providing economical services for the main products. The group also decided that priority should be given to two commodities i.e. dry rubber and sawn timber. Meanwhile consideration would also be given to the two other groups of commodities i.e. fodder/tapioca and vegetable oils. It was also decided that concentration would be focused for both the shipments of dry rubber and sawn timber for ASEAN/Europe and North America destinations as the ASEAN/Japan trade routes were regarded as not feasible for both these commodities. Since this feasibility study is at an initial stage, various problems that will be encountered will have to be studied in depth before the programme can be implemented.

(2) Expert Group on Containerization

The first meeting of this group was held in February 1974. Among the other matters that were discussed at the meeting were the effects of containerization on shippers, and ports, and to analyse whether containerisation will be of advantage to the ASEAN member countries. It was finally decided that since containerization at present will not be of great benefit to the Asean member countries, it would be studied in further detail before positive steps towards it would be taken.

(3) Expert Group on Shipping Statistics and Information

So far, only one meeting has been held on this subject, and it was also agreed that ASEAN member countries should exchange information on shipping data, cargo statistics, shippers' activities, the development of national lines and the shipping line governing each respective country. The group also agreed that each member country should continue its process of collection of cargo statistics through the L.2 scheme.

Up to date the work of these Committees has recorded only modest success. This can be attributed to the complexity of the shipping situation itself as well as the ASEAN member countries, it would be studied in experiences of each member country in maritime affairs. However, the most successful are of ASEAN co-operation in navigation where agreement to co-operate in the safety of life at sea, rescue operations and oil pollution has been finalised.

Federation of ASEAN Shippers' Council [FASC]

The move to set up the ASEAN Shippers' Council was made in order to get shippers' councils from the ASEAN countries to co-ordinate joint efforts in opposing any unreasonable freight increase proposed by the conferences. It is hoped that, with this co-operation, efforts to counter the tendency for too frequent freight increase imposed by the conferences would be more effective.

The setting up of this FASC was considered necessary because shippers in this region not only face almost the same problems in the sense of the similar nature of their commodity (bulky, low-value cargoes) but are also faced with the monopolistic conferences. In addition to that, in certain routes, countries of this

region are also served by the same conferences.

Up to date, FASC has met three times and several stands have been taken as a result of these meetings:-

(i) To take uniform joint action to protest the FEFC freight increase of 26%. Despite the strong protest by FASC to limit the increase to only 10%, FEFC reacted by lowering it only to 18%. Since this failure, the FASC decided to urge their respective national governments to seek the co-operation of their national lines, members of FEFC, to limit the increase to not more than 10%.

(ii) To consider the long-term problems and needs of shippers and shipowners in the ASEAN region, such as consolidation of cargoes, improvement of port services, rationalization of liner services, modernization and expansion of national merchant fleets.

(iii) To adopt the relevant provisions of the Code of Conduct for Liner Conferences pertaining to consultations, negotiations and attributed when each national shippers' council in the region enters into a formal agreement with the respective governments, on the desirability of establishing, expanding or strengthening the operations of Freight Booking Centres and to extend effective assistance towards this purpose.

(iv) To include and utilize non-conference lines to provide additional, regular and efficient services at freight rates lower than the conference rates.

(v) To study the steps to be taken to set up an ASEAN-based and ASEAN-controlled conference to serve this region and Europe, to replace the FEFC; and

(iv) Lastly to undertake the study of data to be used for justifying general freight increases when consulting with the conferences.

7. PAKISTAN

Shipping Potentials:

Viewed in the context of its overall economic growth, foreign trade projections and the objectives of the International Development Strategy for the Second United Nations Development Decade, Pakistan has immense shipping potentials. For almost all of its foreign trade, Pakistan is dependent on shipping. More than 90% of this trade is seaborne but only a small fraction thereof is at present lifted by the national fleet. The present seaborne trade amounts to 10.37 million tons (exports 3.05 million tons and imports 7.32 million tons). The existing fleet strength is 52 ships (general cargo ships 47, bulk carrier 1 and passenger ships 4), with a capacity of about 600,000 tons deadweight and 6,000 passengers, which is very much short of requirements. Between 1971/72 and 1973/74 the average annual liftings of Pak-flag vessels were only 10.8% (exports 20% and imports 7%).

Government Policy:

From the very beginning the policy of the Government has been that the country should have a well-balanced, efficient and economical merchant fleet capable

of carrying the entire coastal trade and a reasonable portion of the foreign trade. But despite that the progress made so far has been slow and limited. The main constraint that has stood in the way of development of shipping in Pakistan, as in the case of most other developing countries, has been lack of financial resources. The situation has become more difficult with the passage of time. Technological development and innovations in the maritime field have brought about profound changes in the shipping requirements, which has made the industry highly capital-intensive. The investment climate on the other hand has become much too undependable for reasons well-known, with the result that the money market has become tight and expensive. Under the circumstances, widespread financial and other measures have been adopted by a large number of countries, including the traditional maritime countries, to help operate and develop their shipping. Pakistan is also considering measures which can be adopted, vis-a-vis its overall growth strategy, to support its shipping in a situation like this.

Fleet Employment:

The Pakistan fleet is at present employed on the following routes:-

1. *Liner:*

U.K./Continent.
U.S.A./Canada.
Far East.

2. *Non-Liner:*

Persian Gulf/Red Sea.
Adriatic/Mediterranean.

3. *Seasonal:*

Red Sea.

Besides, the Pakistan flag vessels are also engaged in tramp trades and international cross trades.

Pakistan is a member of India-Pakistan Conferences and RCD Shipping Services, which cover U.K./Continent and U.S. (East Coast) routes. The Far East trade is carried by the National Shipping Corporation. Until recently the Corporation was a member of the Jappercon Conference but owing to a disagreement between the two over the extent of participation in the trade covered by the Conference the Corporation withdrew from the Conference membership. It is, however, hoped that the difference will be straightened out soon and the Corporation is likely to rejoin the Conference. There is no regular service on the Adriatic/Mediterranean and Persian Gulf/Red Sea routes, and vessels are occasionally put on these routes according to trade requirements. The seasonal trade on the Red Sea route refers to the pilgrims' movement to Saudi Arabia during the Haj season, which is a regular feature.

Efforts are also being made to expand shipping through development of new routes, bilateral agreements, joint ventures, and collaboration with neighbouring and other countries. Recently Pakistan entered into shipping

agreements with Libya, Poland and India. Negotiations are also being made for such agreements with Sri Lanka and the USSR.

Besides, for the present Pakistan's shipping is mainly concentrated in dry cargo break bulk ships. Consideration is, therefore, being given to induct bulk carriers and tankers in the national fleet as well, for which the trade offers lucrative employment opportunities, with even better prospects in future.

Tonnage Requirements

Considerable stress has been placed in the International Development Strategy for the Second United Nations Development Decade on the need for promotion of savings and earnings of foreign exchange in developing countries in the field of "invisibles, including shipping" through expansion of their fleets on a national and multinational basis and increased participation by them in the carriage of maritime cargoes. There are two distinct requirements:

- (a) foreign exchange savings, and
- (b) foreign exchange earnings.

different types of tonnage are needed to cater for different types of requirements. Self-sufficiency in shipping is not the economic aim. The "right" size for the merchant fleet of any country can only be determined with reference to its trade pattern and overall economy. For a working basis, however, the principle to be usually followed is:

- (a) in liner trades 50:50, when only lines of trading partners are involved, or 40:40:20, when a third flag carrier is also included;
- (b) in barter trades 50:50; and
- (c) in other trades to the extent practicable.

Pakistan can, therefore, look forward to building up a fleet capable of lifting 40 to 50% of its trade, plus the outside trade which it can manage to cut in as a third flag carrier. But this is an ideal situation and obviously will take a long time for any country to achieve.

By 1979/80, i.e. during the Fifth Five-Year Plan, the volume of seaborne trade is estimated to increase to 25.59 million tons (general cargo 3.86 million tons, bulk cargo 13.16 million tons and petroleum oils 8.87 million tons). To lift 40% of this trade, the tonnage requirement works out at 142 ships (general cargo ships 104, bulk carriers 31, oil tankers 3 and coasters 4). Besides, for pilgrim traffic 7 passenger ships are also needed. Taking into consideration the available number of ships (52 ships), and replacements to be made during the Fifth Five-Year Plan period (19 ships), the net requirement comes to 116 ships. But as no large-scale expansion could be possible due to limitations of financing, manpower and organizations port infrastructure etc., the requirement for the Fifth Five-Year Plan has been curtailed to 33 ships (general cargo ships 20, bulk carriers 8, oil tankers 3 and coasters 2), which will enable the fleet to lift about 25 per cent of the trade.

Shipping Nationalization:

The Government has recently taken over the

management of the National Shipping Corporation and other Pakistani Shipping Companies under the Pakistan Maritime Shipping (Regulation and Control) Act, 1974, which has been promulgated mainly with the idea that the shipping industry is run and promoted on modern lines. The present fleet is composed of second-hand tonnage most of which has outlived its life. Replacement of obsolete tonnage became a formidable problem which could be done only with full-fledged support of the Government. The Government also intends to acquire the controlling interests of the shipping companies taken over, in consonance with its over-all policy of "mixed economy". No whole-sale nationalization is aimed at.

To control, manage and direct the affairs of the shipping companies taken over, two Boards of Management have been set up, viz., the National Shipping Corporation Board and the Pakistan Shipping Corporation Board. The main function of the Boards of Management is to ensure that the industry runs efficiently and in accordance with sound business principles.

Shipping Legislation:

Pakistan's shipping is mainly governed by -

- (a) Pakistan Merchant Shipping Act 1923;
- (b) Control of Shipping Ordinance 1959;
- (c) Pakistan Maritime Shipping (Regulation and Control) Act, 1974.

The Merchant Shipping Act provides for all matters relating to navigation, registration, survey and safety of ships, recruitment, qualification and other conditions of service of seamen. The Control of Shipping Ordinance, 1959 covers such matters as coastal trading and grant of voyage licences to the Pakistani vessels. The Pakistan Maritime Shipping (Regulation and Control) Act has been designed to give extensive powers to the Government to assume control over the national merchant marine. Foreign flag vessels are exempt.

Ancillary Facilities:

With the growth and modernization of shipping, consideration is also being given to the development of port, training, ship-building and repairing facilities. Briefly the position is as under:-

[i] Port Facilities:-

The Port of Karachi is the only major port which serves the entire sea-borne trade of Pakistan and the transit trade of Afghanistan. The port is well protected at both the western and the eastern flanks of the main shipping channel, which is 4.27 miles long, against the monsoons, storms and the siltation of the sea-bed due to tidal action and littoral drifts. There are 21 shipping berths, 3 oil berths, 2 ship repair jetties and 1 lighterage wharf. The Port is at present equipped to handle about 10 million tons of general cargo and oil per annum. Plans are also afoot to construct 4 additional berths and a modern Marine Oil Terminal designed for 75,000 DWT oil tankers. A feasibility study has also been

carried out for further expansion of dry cargo handling and berthing facilities.

Besides, in view of the growing trade requirements and the limited capacity of the Karachi Port, the Government has recently sanctioned the project of Port Qasim which is to be completed by 1984/85. The planning of the project of Port Qasim has been done mainly for bulk cargo, both oil and dry, and all heavy industries, such as steel mills, fertilizers, petro-chemicals, refineries etc. Surveys and investigations of various inlets are being made to establish further port facilities to serve other parts of the country.

Furthermore, the establishment of an inland Dry Port at Lahore had been the long-felt need of the business community in up-country areas. The considerable formalities involved in the way of import and export of goods, customs clearance and negotiation of shipping documents are time-consuming and often demand the personal attendance of a trader at Port and Customs offices, especially in cases where queries have to be raised due to non-availability of required information and documents with the clearing agents at ports.

The concept of inland dry ports is not a new one. Many countries have these facilities for inland exporters and importers. The procedures laid down and the facilities provided differ in details, but the basic principles are that goods meant for home consumption in up-country areas are allowed to continue their journey from the sea-port by any other mode of transport without payment of duties, either under custom escort or "seal", up to an inland point where all formalities usually performed at a port are completed. Similarly, goods produced in up-country areas are cleared for export at the nominated inland point, and thereafter carried in bond to the port of exit and transhipped aboard vessels without further handling or formalities on the part of the exporter. So far, such facilities had not been provided in Pakistan for sea-borne cargo, which constitutes the bulk of import and export trade in this country.

For the considerations indicated above, it was decided to establish a Dry Port at Lahore, which is a centrally located strategic business area. The Lahore Dry Port was opened for export traffic on 13 April 1974, and it is now contemplated to utilize it for import traffic as well. Negotiations with foreign shipping lines agents are being made in that respect. It is hoped that, when the Lahore Dry Port works in full swing, much of the congestion at the Karachi Port will be lessened.

[ii] Training Facilities:

Growth of a viable national mercantile marine is dependent on the availability of trained and qualified manpower. To meet its requirements locally, the Government established the Pakistan Marine Academy at Karachi in 1971. The Academy imparts pre-sea and pre-workshop training to potential sea-farers intending to qualify as Navigators and Engineers. Careful selection of requisite talent is effected through a comprehensive and arduous selection process. The institution functions on the same lines as "Conway" and "Worcester" in the United Kingdom and the Marine Academy at "Kings

Point", New York, USA. The annual intake has registered an increase, in both the Nautical and the Engineering branches. There is vast scope for expansion. Provision also exists for making training facilities available to friendly countries. Cadets from Saudi Arabia, Sri Lanka, Ethiopia, Iran and Malaysia have been trained or are receiving training in the Academy. Requisitions have been received from a host of friendly countries for the extension of our training facilities to them.

The duration of training at the Academy stretches over a period of two years, during which period they are given training in both academic and professional subjects.

Candidates on their entry must not be more than 20 years of age and should possess a Higher Secondary Certificate or equivalent with Physics and Mathematics. Recruitment to the Nautical and Engineering branches is to be made on an equal basis, with due consideration to the candidates choice. A nominal tuition fee is charged according to the income group of the cadet's parents/guardians. A limited number of scholarships, ranging from Rs 50 to Rs 150 per month, are awarded to deserving cadets.

Arrangements are also made for the allocation of billets with the National Shipping Corporation and other shipping companies and marine workshops for post-Academy training to provide necessary facilities for the requisite cadetship at sea and apprenticeship in workshops for the passing out of Nautical and Engineering cadets respectively.

To produce the required type of seamen, a Seamen's Training Centre for training in the latest techniques in sophisticated ships was also set up in May 1973. The Centre has started imparting regular training to 500 trainees every year and conversant training to others.

[iii] Karachi Shipyard and Engineering Works Limited:

The Karachi Shipyard and Engineering Works Ltd. was established in 1953 by the Pakistan Industrial Development Corporation as one of its heavy engineering projects. At present it is controlled by the Communications Ministry of the Government.

The Karachi Shipyard and Engineering Works Ltd. is divided in to four distinct production divisions, namely (i) Ship-building, (ii) Ship-repairs, (iii) General Engineering and (iv) Foundry. The Shipyard is capable of constructing one ship of 15,000 DWT per year, and 3 oil-tankers or bulk carriers of 30,000 DWT each during a period of 5 years. The Shipyard has so far constructed and delivered about 140 small and large vessels of different types and categories. The largest vessels built so far are 13,500 DWT, three of which have been delivered and two more are under construction, one of which is meant for Abu Dhabi. This is the first export order for a large ocean-going vessel secured by Pakistan. More orders for construction of ocean-going vessels are under negotiation with foreign buyers.

The Karachi Shipyard has facilities for all types of under-water and above-water repairs. Above-water repairs are handled on the quay-wall of the Shipyard and

also in Karachi Harbour. Whenever repairs are handled in the harbour, all tools and equipment like mobile welding generators, compressors etc. are shifted to the harbour and repairs are carried out on the spot. The Karachi Shipyard is equipped with two dry docks. The maximum size of ship that can be docked is 25,000 DWT, which is the normal size of a ship which can enter Karachi Harbour.

Conclusion:

Based on the position discussed above, it is evident that there is much scope for all-round development in the shipping sector. However, the development is slow due to lack of finance. The Government is doing its best to find ways and means to remove this constraint.

8. PAPUA NEW GUINEA

Background

Papua New Guinea is a late starter in all forms of economic development compared with most of the countries of a similar size within the area. This is due to a number of historical factors hardly relevant to this paper, but it can be stated with almost complete accuracy that all development dates back only thirty years. The Japanese invasion and subsequent heavy fighting virtually destroyed what little economic progress had been achieved in the separate territories of Papua and New Guinea prior to 1942, and although a start was made in 1945, real progress did not appear until the United Nations formed the two territories into one trusteeship under Australian protection in 1949. Since then progress has been rapid, leading up to self-government in 1974 and probably full Independence in 1975.

A glance at the map gives an immediate indication of the importance of shipping to the country. The mainland occupies approximately half of the island of New Guinea (the other half being West Irian, a part of Indonesia). There are four main outlying islands to the north east of the mainland - New Britain, New Ireland, Bougainville and Manus. There are also nearly five hundred other inhabited islands within the archipelago. If we count the navigable areas of the two main rivers - the "Fly" and the "Sepik", Papua New Guinea has some five thousand miles of coastline. Except in the most backward interior areas, no part of the country is self-sustaining. Even the villages tend to send produce to market and buy or barter for the essential items of manufactured goods that are either produced at the main towns or imported from abroad. This requires a major transport system involving roads, air and sea.

Not so long ago the road system was almost non-existent and, what there was, was confined to suburban areas around the main towns - the rest was mere bush tracks or nothing at all. In the early days of development, the air played an unusually large part in reaching inland areas. As far back as the 1930s, air provided the sole practical mode of access to the goldfield areas around Wau, for instance. Nowadays, air

transport is primarily for passengers, but even so there are still parts of the country where air provides the sole means of communication.

Why have roads developed so slowly? Even today the only major road system is that connecting the Highlands areas to the port of Lae. No two main coastal ports on the mainland have road communication as yet, although in the next five year plan this may be achieved in places. The answer lies partly in the terrain and partly in economic factors. The mainland is very largely either mountainous or swampy plains, both with dense vegetation making road building extremely difficult. In addition, only two million people inhabit this large country, half of them up in the somewhat remote highlands. Thus relatively small coastal towns are separated by sparsely inhabited country areas, and the costly process of linking them up is rarely directly economically viable, except on a very long term basis.

So coastal shipping has played a very important part in the country's internal development, providing a relatively cheap means of transport serving a large part of the population. Except for the highlands almost all parts of the country are within twenty miles of either the coast or a navigable water-way leading to the coast - hence the highlands areas having the first priority in road construction. Even when the coastal road system is complete, coastal shipping will still be needed on an inter-island basis and is likely to remain competitive elsewhere. The two main cities of Lae and Port Moresby, both coastal ports on the mainland, are only two hundred miles apart by air but six hundred by sea. Such is the rugged nature of the intervening terrain that direct road communication is not yet even being considered.

The sparsity of internal road communications and the reliance on coastal shipping has also meant a need to preserve for as long as possible a wide range of ports handling overseas vessels. Transshipment, with its inherent drawbacks of additional loss, damage, delay and higher costs has to be avoided until such facilities are adequate to cope. To date the large coastal fleet handles mainly internal trade. Where dissemination of imports or collection of exports occur, it is only over short distances and then not on through consignment arrangements. Papua New Guinea's Harbours Board is responsible for thirteen ports at roughly two hundred mile intervals around the coastline, ten of which are involved in overseas trade.

It is part of Government policy to avoid concentration of population into a limited number of large urban areas, and to foster the "stay-put" policy, new industries are assigned locations, rather than leaving it to the free choice of the entrepreneur. Lae, rather than Port Moresby, is the most important port. This is not because it has the largest population but because it is both the most centrally located within the country and also it has the only direct internal link with the half of the population living in the highlands. Thus it would have been natural for Lae to boom if left to develop without restriction. This would have harmful social effects and hence the Government has been somewhat artificially diverting industry to other coastal towns such as Madang, Rabaul and Port Moresby. Madang will also be con-

nected by road to parts of the highlands shortly, Rabaul is the centre for many of the traditional crop exports and Port Moresby, apart from being the administrative capitol, is now becoming the jumping off point for much new development in the Gulf of Papua. So this will mean a more uniform development pattern in line with Government policy.

The Coastal Fleet

The coastal fleet presently numbers about 300 vessels of which some 240 are commercially operated and 60 are government owned. These numbers are tending to diminish, but size is increasing and on the whole overall capacity is rising rather than falling. The Government Fleet does not have any significant impact on commercial cargo or passenger operations. Their main areas of use are for patrol, health, education etc and are only used for commercial work where volume is so small as to be uneconomic for even the smallest operator. A modernisation and replacement program is in hand with the first of the new units due for delivery in 1975.

The main coastal fleet comprises a variety of motor vessels varying in size from 30 to 1,000 tons and varying in age from modern to relatively ancient. The largest number are between 50 and 150 tons, and the average age is 15-20 years. Standards of maintenance and training are regrettably low, despite efforts at improvement, and the loss factor is consequently high, as evidenced by insurance rates.

These vessels are in three distinct categories as follows:-

(a) Intermain port vessels

These are generally the larger conventional units, some forty in number, engaged in moving cargoes between the main ports - beer and empty bottles/cans being the largest single commodity now being carried! Some 160,000 tonnes are moved annually by these vessels. Overseas vessels are not allowed by law to enter the coastal trade, but are occasionally employed for specialised cargoes (e.g. heavy lifts) or at times of shortage of space. The inter-main port vessels attempt to run fairly regular schedules and between them cover most main ports.

(b) Landing craft

Self propelled landing craft have become popular for use where facilities are primitive or non-existent. Their range tends to be rather less than the main-port vessels and their size is also smaller. They are based on the three main shipping centres of Lae, Rabaul and Port Moresby covering the northern mainland, the main islands and the Papuan Gulf respectively. They are used particularly in the transport of mechanical equipment and development material which are often required at extremely remote sites. There are now about twenty such craft ranging from 60-200 tons in capacity.

(c) Feeder service vessels

These are the craft used on a district basis, rarely travelling more than 200 miles from the main port base.

Their size range is usually from 50 to 120 tons, of conventional design and used primarily to gather in produce (particularly copra) from outlying plantations and to take back the supplies needed to maintain them. They ply both between the numerous small islands and also along the coastlines between the main ports where there are still no roads. There are some 180 such vessels presently operating. This number will reduce as coastal roads are built, but in some areas which are predominantly small islands such as the Milne Bay District, they will always be required.

Government Control of the Coastal Fleet

The current Shipping Ordinance gives the Minister for Transport authority (amongst other things) to set maximum rates of freight and to issue Coastal Trading Licences. In practice, this power is delegated to two committees, each chaired by the Superintendent of Shipping in the Maritime Division of his department.

The Coastal Licensing Committee is charged with ensuring that only vessels with valid licences are trading on the coast, that licences are issued only to a sufficient number of vessels needed to handle cargoes offering with a reasonable margin, and that such vessels are the most suitable available. The committee meets every four to six weeks to process applications, and has issued its own guidelines to local shipowners, the majority of whom are members of a local Association of Shipowners. To be effective, the committee must be in receipt of sufficient up to date data regarding both the licenced vessels and the cargoes moving. This is supplied by the shipowners themselves, so far as the inter main port trade is concerned, and it is correlated and tabulated by the Shipping Section. If shipowners fail to keep the Section informed of movements and tonnages they are likely to forfeit renewal of licence (validity currently 12 months only) and hence they may protest but the data is always eventually forthcoming. The shipping registry gives details of vessels and the Shipping Guide provides details of their movements - hence effective comparisons can be made between tonnage availability and cargo movement. The feedback of total shipping tonnage, port by port, is useful to the shipowners when planning expansion, replacements etc.

On the freight side a tariff of maximum rates is enforced, covering all important commodities over the full range of inter main port distances. Negotiation for changes in commodity, distance or other factors, as well as for overall increases is between the Coastal Shipowners Association on the one hand, and the Coastal Freight Rates Committee, which includes departmental officers and representatives of local Chambers of Commerce Shippers Council etc. This committee recommends its findings to the Minister, whose ultimate approval is needed before changes can be effected. No subsidy of any kind is given to shipping thus the level of freight rates must permit reasonable economic profitability. Competition provides the chief means of restraint and the published tariff lists maximum, not minimum freight rates, in any situation.

Overseas Liner Shipping Services

The following summary shows the size and relative importance of each of the general cargo trades into and out of Papua New Guinea in the financial year 1973/74.

Imports	Tons	Percentage of total
1. Australia	342,068	53.7
2. Japan	172,359	27.0
3. UK/Continent	70,330	11.1
4. Hong Kong	36,798	5.7
5. Singapore	8,511	1.2
6. New Zealand	7,233	1.1
7. Miscellaneous	126	0.2
	<u>637,425</u>	

Exports	Tons	Percentage of total
1. Australia	132,573	44.0
2. UK/Continent	95,400	31.7
3. Japan	36,356	12.1
4. USA	23,727	7.9
5. New Zealand	5,298	1.7
6. Hong Kong	4,622	1.5
7. Singapore	2,041	0.7
8. Miscellaneous	1,125	0.4
	<u>301,143</u>	

At the moment there are seven lines sharing the Australian trade, three for Japan, and one each for the others. Mostly conventional vessels are used by the lines on the smaller trades, but in the Australian trade there is both variety and continuing development, as shown by the following, in descending order of sophistication:-

Pacific Far East Line	LASH vessels, lighters and containers
Container Pacific Express)	Wide hatch container vessels
Nauru Pacific)	(non-cellular)
New Guinea Australia Line)	Side port loaders, fully palletised
Karlander New Guinea)	
New Guinea Express	Wide hatch mixed stow
Hong Kong Island Shipping	Conventional break-bulk

The Australian vessels cover three major loading ports on the East coast (not Adelaide) and ten ports of discharge in Papua New Guinea, although any one vessel rarely loads at more than two and discharges at more than three. Until recently four lines shared this trade for a number of years, and formed an unofficial conference for the purpose of setting rates, establishing routes and frequencies etc. However the congestion in Australian ports in 1974 lead to far longer turn-arounds and the existing eleven vessels were no longer able to cope with the northbound volume of cargo movement. This plus the fuel crisis, not only led to large freight increases but also to the opportunity for other lines to come in and three of the seven listed above have less than six months experience in the trade at the time of writing.

The trend is for both imports and exports to

expand gradually, but there is likely to be a shift away from the heavy dominance of Australia. An independent Papua New Guinea will be better able to search for world-wide markets and sources of supply at competitive prices. Australia will continue to enjoy favoured status due to proximity, but the historical and economical ties will be less noticeable.

Control of Overseas Shipping

There is no legislation that gives the Government of Papua New Guinea any control over overseas shipping at the moment, although a new Merchant Shipping Act now being drafted will:-

(a) reserve part of the country's export cargo for any future National (Line) flag shipping;

(b) enforce UNCTAD regulations on conference lines;

(c) exert restrictions arising out of the (Trade Restrictions Act) Restricted Trade Practices Act.

In the meantime, close liaison is maintained with all the important overseas shipping lines and their local agent, who are actively encouraged to negotiate with the PNG Shippers' Council on all export matters. This latter body has been in existence nearly two years and has so far been recognised by the Lines on the Australian, UK/Continent, Japanese and New Zealand trades. How effective this body is in affecting freight increases, schedules etc it is difficult to say. It is gaining experience and support in the country. It is regrettable that it can bring no influence to bear with respect to imports, that function being reserved for the relative Shipping Council in the particular country exporting to PNG — and the effectiveness of each is proportional to the importance it attaches to its trade with this country, relative to its trade elsewhere.

National Shipping Line

In 1973 the Government commissioned a Consultant's Study into overseas shipping with particular reference to a National Shipping Line. The findings were, briefly, that a National Line would have advantages in the fields of foreign exchange and security at times of emergency, but was unlikely to lead to freight savings or other similar economic benefits. Since then the Government has instituted a number of minor preparatory moves such as legislation and data collection, but has not yet committed itself to any positive move into the creation of a National Line beyond the creation of a National Shipping Commission which will be charged with investigating all areas of possible participation — overseas, liner, bulk, coastal, passenger etc. — and the organisation required if a decision is taken to go into one or more of these areas.

The probability is that a start will be made in the next few years into setting up a National Line, initially solely operating medium size bulk carriers. There are three chief reasons, relative simplicity, probable profitability and availability of bulk cargoes in the country domestic trade, i.e. without tramping or looking for cross-trade movements.

Bulk Trades

Papua New Guinea is involved in an increasing number of bulk cargo movements. Copper concentrates from the Bougainville mine, wood chips from Madang, timber from several locations are all exported by bulk carriers, and naturally oil is imported in bulk tankers, together with liquified natural gas. Further developments on the exporting side in the next few years are likely to lead to more copper, timber and wood chip shipments, whilst grain will be imported in bulk for two proposed flour mills now in the planning stages.

Going further ahead there will also be new industries associated with the vast Purari Hydro-Electric Scheme — almost certainly bauxite smelting will be one such industry, and it will again involve bulk shipping operations.

It is into these areas that Government is looking to introduce its own National Shipping Line, and, is taking measures to ensure a reasonable participation by enacting appropriate legislation.

Passenger Services

At the lower end of the scale the large coastal fleet provides a means of passenger conveyance in somewhat primitive conditions. "Deck" passengers are literally just that, passengers carried, on deck, providing almost all of their own requirements. A few vessels are better equipped than others, but on the whole standards are low. As the majority of passengers have never known better there is, as yet, little pressure for improvement and when it does come it will be as a result of Governmental requirements rather than the good nature of shipowners. One limiting factor at the moment is the prevalence of diesel and motor spirit in drums carried on deck by many coastal vessels — fuel and passengers do not mix!

In the middle ranges passenger accommodation on the sea routes is almost non-existent. Middle class and business travel is exclusively by air.

At the highest level, Papua New Guinea does receive a number of calls by international passenger and cruise liners each year. Purely passenger vessels on liner routes are now comparatively rare and PNG has not developed its tourist trade as much as some other Pacific countries. Thus some twenty calls per annum, spread over a number of ports, is the current level of this traffic. It could increase considerably — the vessels are certainly in the area, Fiji has over a hundred calls per annum at Suva alone. However, in order to do so, the Government must have a fundamental change of heart and provide more of the basic tourist attractions than are available at present. At the moment the Government appears to be concerned over the possible harmful social effects of high levels of tourism, and is deliberately playing down development in this area.

Participation in Regional Shipping

The countries represented at the South Pacific Forum decided (in August 1974) on the creation of a Regional Shipping Council for the purpose of setting

policy for an eventual Regional Shipping Service. Papua New Guinea is participating, being represented both on this council and the Advisory Board. Preliminary investigations, leading towards an initial inter-island service, are now under way.

Papua New Guinea is the extreme western member of this group and is also the largest by both land area and population. It is true that so far it has not had a great deal of contact with the other island territories, but this is gradually changing. Trade with these countries will slowly increase, and PNG sees the Regional Shipping Service, in its area, as mainly a means of developing trade areas that are not yet economically viable and hence shunned by commercial carriers. The PNG Government accepts the fact that for a number of years any such inter-island service is likely to be loss-making, and, provided such a service is not over ambitious, it is prepared to provide its proportion of the necessary subsidy.

In some South Pacific countries, the role of the Regional Shipping Service may be seen as a more direct provider of regular services — i.e. an improvement on those existing. This is hardly the case for this country, where established trades are relatively well served. But by pioneering, and as a means of providing effective, visible, regional co-operation the Regional Shipping Line is seen as being a worthwhile enterprise and, as such, receives the support of the PNG Government.

Ancillary Facilities

There are two organisations in the country which, between them, provide the back-up services needed for the shipping industry. Both come under the Minister for Transport and Civil Aviation. They are:-

(a) The Papua New Guinea Harbours Board

This is a Statutory Body with an elected Chairman and Board, a permanent General Manager and staff. It is responsible for the provision of major port facilities and their maintenance, including all wharves and cargo sheds. It is not an employer of labour, nor a cargo handler. Licensed stevedores in each port (2-4 depending on size) are responsible for cargo handling from the ship's hold through discharge, storage to delivery for imports, and the reverse for exports. Sheds are not leased to the stevedoring contractors — the Harbours Board Managers (Port) direct shed space utilisation. All cargo handling gear is the property of the stevedoring contractors, or on lease to them from other sources.

Berthage and wharfage fees are collected by the Harbours Board to meet development loan interest charges and other overheads. Forward planning for improving and extending wharf facilities continues — for instance \$US 8 million has recently been lent to PNG by the World Bank for four major port projects. The smallest, at Port Moresby, was completed at the end of 1974, two more will be completed at Lae and Kieta in mid-1975 and the last, at Alotau, is due for completion at the end of 1975. A further major expansion at Port Moresby is now in the on-site survey stage and long-range plans are complete for Lae.

(b) The Maritime Division of the Department of Transport

The Operations Section is responsible for the provision of harbour masters, pilots, surveyors, maintenance and crewing of the government fleet, provision of navigational aids, training of seamen etc. The Shipping Section either is, or shortly will be, responsible for licensing and registration of local vessels and seamen, data collection and freight investigation, freight rate negotiations and liaison with both local and overseas lines, legislation and enforcement of the Merchant Shipping Act (now in draft form only) and the carrying out of negotiations leading to a National Shipping Line. The provision of minor wharves and cargo sheds will shortly transfer from the shipping to the operations section to combine with a new responsibility for hydrographic surveys.

Future Trends

Increases are expected in the volume of trade handled by coastal vessels and in bulk shipping. Despite greater availability of coastal roads, increasing primary and secondary local industry will need coastal shipping to distribute its products. There is also a distinct possibility that overseas vessels will reduce their spread of regular ports of call, necessitating transshipment by coastal vessel. It is to be hoped that standards can be improved without involving large cost increases, and to acquire the necessary capital the coastal trade may be opened up to overseas operators prepared to make long-term commitments. The government is also looking into possible fiscal incentives as an aid to improvements in standards. New major industries and further development of natural timber and mineral resources will lead to greater use of bulk carriers.

The conventional liner trade is likely to remain fairly static in overall volume. Changes in content and variations in trading patterns are to be expected as the country becomes independent. If similar experiences in other countries are a reliable guide, we may expect to see a reduction in the importation of manufactured and fully-processed items in the upper reaches of the price bracket, replaced by raw materials, semi-manufactured items for local assembly and goods aimed at the newly affluent (modestly!) local population. Sources of supply will be highly cost orientated and trade missions will be established by neighbouring nations seeking our custom. But despite an increasing population better able to afford imported goods, it must be expected that this purchasing power will be offset by local manufacture, particularly in foodstuffs.

The government's awareness of the importance of shipping has been awakened and Government participation to ensure the best and cheapest services will increase through the activities of the Shipping Section of the Department of Transport. Training is very much a key problem and it is to be hoped that training programmes will be more effective than in the past.

9. PHILIPPINES

"Whoever commands the sea, commands the trade; whoever commands the trade of the world, commands the riches of the world and consequently, the world itself". Such was the tribute given by Sir Walter Raleigh to the sea because of the significant role it plays in the economic development of any nation. True, memorable battles have been fought in the annals of history for the conquest of the sea because of its unlimited resources.

It is an undeniable fact, therefore, that shipping as an extended arm of production and marketing constitutes an economic infrastructure of a country. To the Philippines, this fact assumes double significance because of the more than 7,000 islands that comprise the archipelago. The pivotal role shipping plays in internal commerce as well as foreign trade cannot be over-emphasized. It is further recognized that foreign exchange savings and balance of payments issues rely on no small measure on the adequacy, efficiency and cost of shipping services.

Overseas Shipping and Inter-island Shipping

While the maritime tradition of the Philippines has long been established, indicators point out the fact that such a tradition has not been nourished and allowed to grow to meet the increasing demands of sea-borne trade. Of the 110 vessels engaged in overseas shipping, more than one half will have reached the end of their economic life this year. The status of the 434 vessels plying domestic routes leaves much to be desired since most of them are converted warships of Second World War vintage. It is a tribute to Filipino ingenuity, therefore, that these vessels have continued to exist despite their having outlived their age of obsolescence. However, with the liberalized loans launched by government to shipping lines and shipyards, it is expected that, within the foreseeable future, newer ships of types more suitable to the trade will ply Philippine waters. In addition, the Philippines has become aware of the gradual trend towards fleet diversification which has assumed greater importance within maritime circles.

The total gross tonnage share of Philippine vessels engaged in interocean shipping is barely 15%. Based on the growth of cargo carried by local lines and the productivity of shipping space for such vessels, a total tonnage requirement of 1,265,000 GT is estimated. Existing tonnage is only 819,948 GT which means an additional 445,052 GT of fleet build-up is necessary to at least maintain a fair share in the total trade. For replacement of obsolete and uneconomic-size vessels; 284,358 GT is required so that total additional tonnage requirements amount to 729,410 GT.

Recognition of domestic demand for shipping services, both qualitatively and quantitatively, is a known fact. Total passenger and cargo load serviced by inter-island shipping for the last five years exhibited average growth rates of 9.5% and 7.3% respectively. Cargo load for coastwise vessels are expected to expand to 9.9

million tons this year and is projected to reach 17.7 million tons ten years from now. According to the same projections, passenger traffic will climb to 1.9 million in 1975. Based on an average growth rate of 9.5%, passenger traffic in ten years more will be 2.8 million.

Port Development

The Philippines is presently undertaking a huge port development programme to satisfy the demands of increased traffic as well as to meet the changing needs of ship technology.

A port development priorities hierarchy was done based on existing capacities, cargo traffic, nature and structure of port hinterland and projections of leading development factors such as commodity flows, transportation and road infrastructure, services, tourism, etc. This strategy was adopted apropos to the accepted planning concept of an integrated and fully co-ordinated transportation system within a social milieu with port development.

There were two major reasons for adopting such a strategy. First, the selection of a few key ports would minimize the uneconomic multiplicity of the numerous seaports in the country. The rationale was to concentrate shipping operations on these few ports for greater efficiency and economy especially because the concept of common loading points for specific exports as lumber and plywood, copra, pineapple, coconut oil, etc. was being implemented. Secondly, the scarcity of funds, mostly from loans, called for an optimal allocation of resources.

Primary ports ranked among the first priority group, such as Manila, Cebu, Davao and Cagayan de Oro, and the port at the Export Processing Zone in Mariveles, are now undergoing improvement and expansion. Manila, the premier port of the country has had a whole pier converted into a container terminal. The gantry crane installed by the American President Lines was the result of government inducement to the private shipping sector for capital investments in ports. In return tax holidays have been extended by government to such private initiative. The start of 1975 saw the beginning of a roll-on/roll-off service in the Philippines - Australia trade with port infrastructure for ro-ro service financed by the Australian national lines. The scheme to channel private capital to improve port facilities is currently being intensified since it answers the desperate need for funds the government is not capable to fill.

The innovation of better cargo-handling techniques, particularly of containerization, can decidedly have a serious impact on the trade of a country. Aware of the rapidly changing shipping scene, the Government has directed some action on drawing-board blueprints of a container port in Manila. Construction of an International Port is underway which is envisioned to cater to the container traffic which in 1974 has soared to a level twice that of the previous year. Feasibility studies for the construction of a new port in Cotabato, a province in the southern part of the Philippines, have just been finished and work is expected to commence as soon as the Asian Development Bank-approved loan is released.

Philippine Shippers Council

Indeed the liner conference system has emerged during a period in history when shipowner interests were regarded as predominant over those of shippers. Through the years, however, there has been a recognition of the need for a change in balance between shipowner and shipper interests. Efforts of ESCAP along this line has made possible the organization of shippers councils in the region and the creation of the Philippine Shippers Council resulted from the encouragement and expertise provided by ESCAP. Various commodity associations including individual shippers and firms have now formed into a cohesive group to promote and protect their common interest and to "negotiate" with foreign shipping interests for reasonable freight rates and optimum shipping terms. It is a lamentable fact, however, that legitimate negotiation procedures have not been established with the conference although the latter has manifested recognition of the Philippine Shippers Council as a consultation machinery. The recent dramatic change of the Far Eastern Freight Conference proposed increase in freight rates from 26% to 18% can undoubtedly be attributed by the stand made by the shippers council of the ASEAN nations. The ideal of establishing a Federation of ASEAN Shippers Council is a momentum of hope expected to be a pulsating reality within this year.

Philippine Participation in International Forums

The world shipping scene is one of diversity. Yet internationalization of common thoughts are made possible through the venue provided by the United Nations. As a member of the United Nations, the Philippines is signatory to a number of conventions among which are the following:

International Convention of the Safety of Life at Sea 1960

International Regulation for Preventing Collisions at Sea 1960

International Convention for the Prevention of the Pollution of the Sea - by 0.1 1954

Code of Conduct for Liner Conferences

As a member of the International Labor Organization and the Inter-Governmental Maritime Consultative Organization, the Philippines has participated during deliberations of these international forums as well as in conferences on the law of the sea. On a regional and subregional level, our country has jointly embarked on economic co-operation projects under the mantle of ESCAP and ASEAN and have adopted an ever-vigilant stance to see that these projects are thoroughly inter-consistent and well-co-ordinated for the mutual benefits of the members of the region. At present, ASEAN is deeply involved in co-operative ventures on bulk shipping, marine pollution, containerization, economic statistics on shipping and search and rescue. It is gratifying to note that these forums develop through consultations, a generally accepted overall and long-term view of regional economic co-operation from which framers of development plans and policies of each member country could assess the consistency of national development

programme with regional plans.

Shipping Legislation

Along with the "revolution" in shipping that is currently sweeping the world today is the imperative need for organizational and institutional changes. Aware of this fundamental need, the Philippine Government has initiated a number of laws with the end in view of accelerating development in shipping and maritime activities.

1. Foremost among these palliative measures was the creation of a Maritime Industry Authority to oversee the industry as well as to provide an integrative and total approach to the broad spectrum encompassed by shipping and maritime matters. The organization of the MARINA, the Authority so coined, could be considered a gigantic move in the right direction since the fragmentation of offices and disciplines in the bygone years had been a deterrent to the development of shipping. Initial work programme centers on the development of a 10-year maritime industry programme which would include the following:

- (a) Rationalization of shipping services especially in the coastwise trade.
- (b) Identification and selection of suitable standardized ship designs for a fleet replacement project in the domestic trade.
- (c) Manpower development through a maritime training programme including shipbuilding manpower training
- (d) Development of shipbuilding and repair yards including shipbuilding back-up industries.
- (e) Professionalization in shipping expertise on executive and managerial as well as in supervisory levels.

2. Presidential Decree No. 474 passed only last year creating the Philippine Ports Authority was a most welcome move since port administration and management had for scores of years been almost an inalienable right of the Bureau of Customs. As an autonomous centralized body to supervise, regulate and control the primary, secondary and tertiary ports of the archipelago, the PPA is expected to wield tremendous influence in improving the efficiency of all ports.

3. Board of Investments Public Utilities Priorities Plan qualifies shipping and ship repair activities for investment incentives. Under this plan, Filipino ownership capital has been reduced from 75% to 60%.

4. Republic Act No. 1937 provides that all fuel imported in the Philippines used for propulsion of vessels engaged in coastwise and overseas trade shall be subject to a refund or tax credit of 99% of duty imposed.

5. Board of Investments Priorities Plan considers shipbuilding as a preferred area of investment so that 100% foreign equity is considered acceptable.

6. The Overseas Seaman's Board has been formed to cater to the special problems of our seamen who ply the seven seas. Conscious of the aphorism which states that "a ship is only as good as the men who built her, the power which steers her and the hands that guide

her", efforts are, therefore, focused on the improvement of seamanship in the state-managed Philippine Merchant Marine Academy and the 23 nautical schools as well as the training institute established at the Don Bosco Technical School by the Filipino Shipowners Association and the Conference of Inter-island Shipowners and Operators. The Professional Regulations Commission which has a Board of Deck Officers works in close co-ordination with the Overseas Seaman's Board.

7. In view of the apparent demand for second tonnage to augment the limited bottoms available, a presidential decree was recently promulgated exempting the importation of second-hand vessels for domestic and interocean shipping from the customary 10% ad valorem duty and 7% compensating tax. As a corollary to this, soft loans to shipping lines and shipyards are being given by the Development Bank of the Philippines through its industrial financing operations and the prospect of a revolving Shipping Development Fund is earmarked for implementation in the near future.

8. The law allowing the entry of spare parts of ships free of tax has somewhat eased the tight money situation in the industry.

9. The law providing exemption from income taxes of international shipping and construction of vessels for overseas trade until September 9, 1975 is presently under study for possible extension.

From this overview of the whole shipping perspective in the Philippines, one can rightly conclude that shipping is one of the important wheels of the economic machinery to which the Government has directed its efforts which, we believe, will determine the course of future events.

Shipping in the Philippines

A. Overseas Shipping

1. The Philippines overseas shipping fleet carries only about 15% of the total RP trade. A full 85% of the trade is carried by foreign registered vessels.
2. In 1970, total RP tonnage was 819,948 GRT, composed of about 130 ships. However, about 70% of these vessels are less than 10,000 GRT. 11% are between 10,000 to 20,000 GRT and only about 19% are above 20,000 GRT.
3. In age, about 42% of the number of vessels are more than 20 years old, 37% are between 10 and 20 years old, and only about 21% are less than 10 years old.
4. The top RP shipping companies according to gross tonnage as of 1969 are as follows:

	Total gross tonnage	Number of ships owned	Average GT per ship
1. Maritime Company of the Phil.	104,809	16	6,550
2. Philippine President Lines, Inc	84,355	12	7,029
3. Madrigal Shipping Company	81,252	6	13,542
4. United Philippine Lines	76,815	8	9,601
5. Eastern Shipping Lines	50,571	8	6,321
6. Northern Lines, Inc.	47,892	9	5,321
7. Bothelo Transport Corp.	30,715	3	10,238
8. Magsaysay Lines, Inc.	30,000	3	10,000
9. General Shipping Co.	27,701	3	9,233
10. Everett Steamship Corp.	24,611	5	4,928
11. Universal Shipping Corp.	23,751	5	4,750

5. Liner services are those governed by shipping associations, called Conferences. At present, 15 Conferences service the Philippines outbound and inbound trade.

The outbound (export cargo) Conferences are:

1. Philippines/Asia Conference
2. Philippines/Europe Conference
3. Philippines/American Conference

The inbound (import cargo) Conferences are:

1. Pacific Westbound Conference
2. Far East Conference
3. Japan/Philippines Freight Conference
4. Australia North-bound Shipping Conference
5. Hongkong/Philippine Islands Freight Conference
6. Bay of Bengal/Philippines Freight Conference
7. Entente de Fret et Sortie de Marseille
8. Italy/Far East Conference
9. Port Said and Suez/Far East Freight Agreement
10. Spain/Far East Freight Conference

The Conference serving the Philippines both ways are:

1. Australia and New Zealand/Eastern Shipping Conference
2. Brazil/Far East/Brazil Freight Conference

6. Most RP cargoes are carried by Conference vessels. However, bulk cargoes like sugar, mineral ore, logs, lumber, and plywood are carried by non-liner vessels, or tramp vessels.

7. Major problems of RP Ocean Shipping

- a. Need to replace the many obsolescent, uneconomic and slower vessels, to make them competitive and render better service to RP overseas trade.
- b. Cartelistic hold of foreign shipping and liner conferences, which discriminate against RP vessels and small exports.
- c. Inadequate financing for acquisition of new or newer vessels, which are quite expensive.
- d. Inadequate port and harbour facilities for ocean-going vessels.
- e. Expensive, unrealistic, unduly burdensome maritime laws and regulations; red-tape in the registration, documentation, inspection and operations of the vessels by more than one government office.
- f. Inadequate incentives and support from the RP Government for Philippine flag vessels, inducing numerous Philippine-owned vessels to be registered under foreign flags of convenience.
- g. Incapability of RP shipyards to construct modern ocean-going vessels.

8. Domestic shipping

1. 85% of commodity movements within the

Philippines are by water transportation. This is because the Philippines is composed of over 7,000 islands.

2. The Philippine inter-island fleet as of 1971 consists of about 434 vessels with a GRT of 390,499. By size, 73% of these vessels are less than 1,000 GT, and only less than 2% are more than 5,000 GT. By age, 68% of these vessels are obsolescent, being more than 20 years old, and only about 16% are less than 10 years old.

3. Problems of domestic shipping

a. Ineffective supervision and regulation resulting in chaotic shipping conditions: maldistribution of vessels with many routes overcrowded and other routes needed for development of the areas undersupplied by shipping services; many vessels are often overloaded with cargoes and third-class passengers herded like and together with animals; unsatisfactory freight and passenger services; posted sailing schedules are long delayed; prevalence of unscrupulous shipping trade practices; cut-throat competition among shipping companies.

b. Shipping companies have to deal with four separate government offices (Philippine Coast Guard, Board and Bureau of Transportation, Bureau of Customs) all concerned with regulating domestic shipping; red tape, confusion, waste and inefficiency are abetted thereby.

c. Obsolescence of most of the inter-island vessels which are also uneconomic to operate, needing frequent repairs, expensive maintenance, unsafe to life and property.

d. Incapacity of domestic shipyards to build bigger vessels needed by inter-island shipping companies;

c. Under-capitalization and under-financing of domestic shipping companies which have to rely on loans at high, commercial interest rates and which have low profitability. Many shipping companies operate only a few, small vessels.

f. Non-release of funds out of the 100 million pesos appropriated under RA 1909 for NASSCO to construct or assist in construction of inter-island vessels.

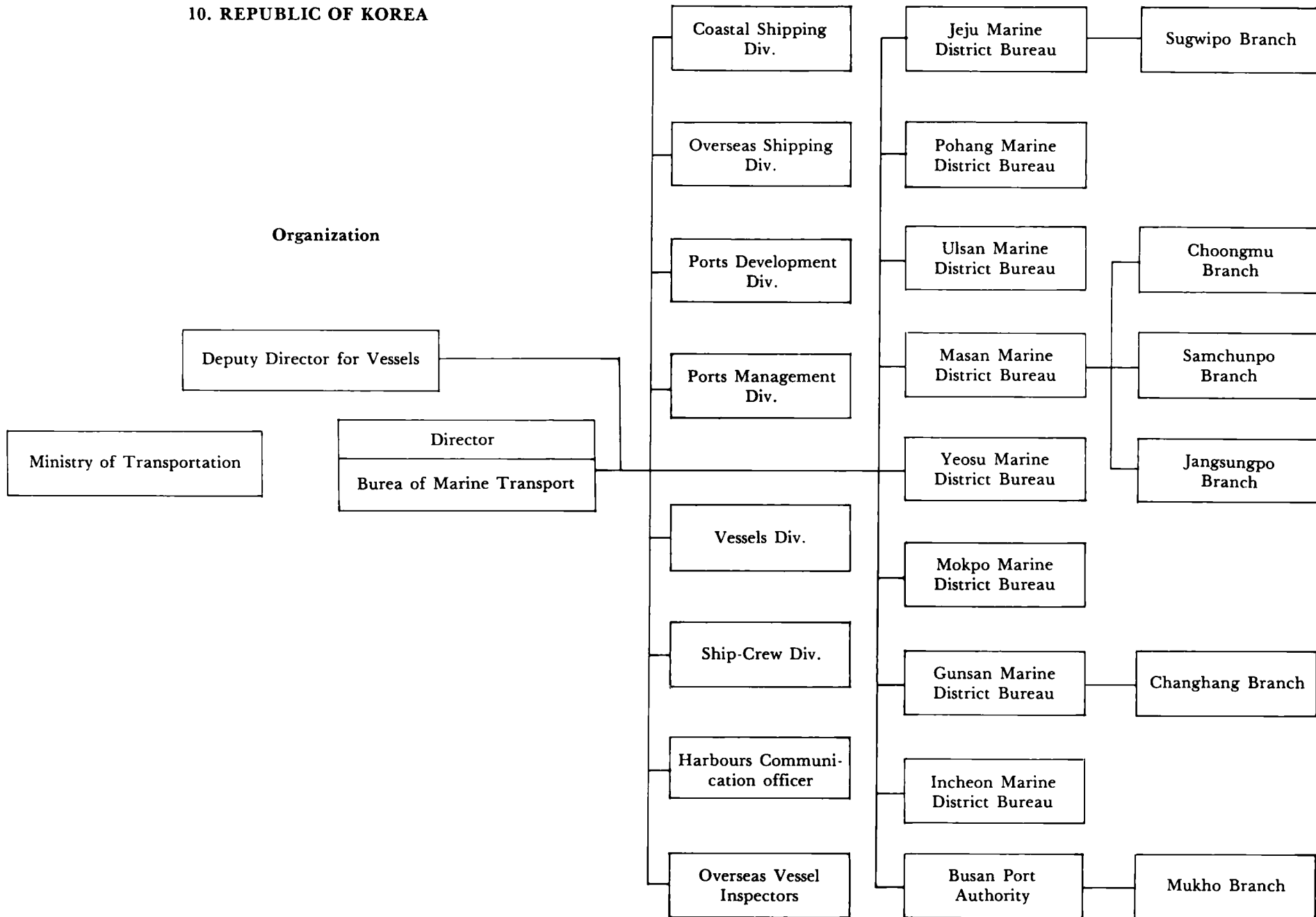
g. Lack of adequate financial and other incentives for domestic shipping. Its importations are still subject to 10% tariff duty and 7% compensating tax unlike overseas shipping which has already been exempted therefrom.

h. Cargo handling is inefficient, lacking modern equipment and facilities.

i. Port infrastructures like piers, wharves, cargo sheds, inland transport linkages are inadequate and in poor condition. Ships have to wait unduly long to load and unload in ports for want of berthing, cargo-handling and warehousing facilities.

10. REPUBLIC OF KOREA

Organization



Status of International Merchant Marine

While the first and second five-year economic development plans were carried out under the slogan of modernization of Korea, the aspect of international marine transport underwent a gradual renewal; gross tonnage of international merchant vessels owned by Korean nationals reached two million tons as of 1974, whereas Korean national vessels are now competing with foreign vessels in seven oceans around the world.

This is the result of the continued phenomenal growth of marine transport by an average annual rate of 30 per cent through ceaseless efforts by both the business circle and the Government.

Externally, the existing liner service to America and Southeast Asia will be further strengthened and liner services will be extended to Europe and Australia, while large tankers and bulk-carriers will be increased in order to enhance the transport capacity of imported cargo in large quantity.

Trend of Increase in Ocean-Going Vessels

Year	1967	1968	1969	1970	1971	1972	1973
Number	112	131	141	142	146	202	251
G/T	411,973	523,000	665,770	797,680	836,345	1,004,300	1,236,300

1974: 1,973,168 G/T (338 ships) Note: 1975 Plan: 2,473,168 (338 ships)

Status of Ocean-Going Vessels

Route	Tanker	Lumber	General Cargo	Others	Total
Korea/ Japan	(6) 4,643	—	(123) 166,005	(25) 48,920	(154) 219,568
Korea/ South- east Asia	(9) 26,963	(66) 248,652	(23) 91,280	—	(98) 366,895
Korea/ America	(1) 83,819	(2) 25,200	(34) 377,413	(1) 1,400	(38) 487,827
Cross trade	(20) 658,434	(14) 65,172	(11) 164,897	(3) 10,375	(48) 898,878
Total	(36) 773,854	(82) 339,024	(191) 799,595	(29) 60,695	(338) 1,973,168

Note: () number of vessels

The total number of Korean national vessels engaged in international transport is 338 vessels with a total capacity of 1,973,000 gross tonnage, among which 55 vessels with 181,700 gross tonnage are placed in liner service to and from USA, Japan and southeast Asia, while 283 vessels with 1,791,468 G/T including bulk-carriers, log-carriers, tankers, and general-cargo-ships are cruising on tramper routes.

The amount of overseas trade in 1974 is composed of 8,120,000 tons of exported cargo which increased by 4 per cent over 1973 and 33,990,000 tons of imported cargo which increased by 8 per cent under the previous year.

Exported and Imported Cargo by Korean Vessels

Year	Exported cargo		Imported cargo		Total	
	Total quantity	By Korean vessels	Total quantity	By Korean vessels	Quantity	By Korean vessels
1967	1,786	751 (42.0%)	9,737	2,144 (22.0%)	11,523	2,898 (25.1%)
1968	2,254	964 (42.8%)	14,535	2,986 (21.4%)	15,796	3,860 (24.4%)
1969	2,891	1,199 (41.5%)	17,109	3,777 (22.1%)	20,000	4,976 (24.9%)
1970	3,387	1,624 (47.9%)	19,056	3,859 (20.3%)	22,443	5,483 (24.4%)
1971	4,135	1,460 (35.1%)	25,565	5,489 (21.5%)	29,720	6,749 (23.4%)
1972	6,010	1,898 (31.5%)	24,687	4,849 (19.6%)	30,707	6,747 (22%)
1973	7,811	3,489 (44%)	31,384	7,518 (24%)	39,195	22,007 (28%)
1974	8,120	4,440 (55%)	33,990	8,690 (26%)	42,110	13,130 (31%)

Domestic Marine Transport

Domestic carriers are composed of 198 passenger boats with 19,195 G/T which accounts for 9 per cent of total domestic tonnage and 11 per cent of total of number of domestic ships, 1,354 freight ships with 85,403 G/T accounting for 42 per cent in tonnage and 72 per cent in number of ships, and 312 tankers with 97,968 G/T accounting for 48 per cent in tonnage and 17 per cent in number of ships. Thus, domestic tankers are increasing in size while the sizes of passenger and freight ships remain small or medium.

Total number of routes for domestic service is 161 as for 1973, composed of 126, ordinary routes and 35 compulsory routes, and between Pusan and Cheju in particular 2 passenger boats in 1,000 tons including S.S. Arirang provide regular service.

coastal passenger boats serve not only as transport means between islands but also as leisure boats for tourists from urban areas. As the Hanryeo area along the southern coast was designated as a maritime national park, and seaside tourist attractions are being developed the service of high-speed tourist boats became necessary. A high-speed boat, S.S. Angel, is already in service on the Pusan-Chungmu-Yosu routes in Hanryeo Maritime Park, while ferry boats will serve between Pusan, Cheju and Mokpo in the near future. It is also planned to build a sound foundation for cheerful travel and modernization of passenger boats through improving the existing sightseeing routes and opening new routes.

Ports and Harbours

In Korea, there are approximately 1,300 ports, small fishery ports or open ports, with a total length of quay wall of 17,300 km there are 17 first-class ports and 23 second-class ports and the rest are provincial ports.

There are 16 "open ports" available for foreign trade, viz. Inchon, Changhang, Gunsan, Mokpo, Yusu, Masan, Choongmu, Samchonpo, Jangsungpo, Busan, Pohang, Ulsan, Mukho, Jeju, Sokcho and Sugwipo.

Port facilities, including tug-boats, are constructed, installed and operated by the Government directly, but most of the cargo-handling is owned and operated by the private forwarding companies.

The status of port facilities is as follows:

Total length of quay wall	Wharf	Transit shed	Tug-boat	Patrol boat
16,021 m	18,997 m	93,766 m ²	17	9
(2,746 G/T) (129 G/T)				

Others		
Berth capacity	Cargo-handling availability	Gangmen
110 1,000 D/W — 40,000 D/W	27,682 1,000 tons	18,993

Port development Plan

In order to evaluate the increasing demand of sea cargo volume and requirements of port facilities in accordance with the national economic growth, an over-all development study of the major ports in the country was carried out from 1971 to 1972. As a result, the urgent development of the ports of Busan and Mukho Eastcoast before other major ports was recommended in the report of the above survey.

For the successful accomplishment of the development projects and efficient port operation, Busan Port Authority was established under the jurisdiction of the Minister of Transportation in 1973.

a. Busan Port:

Busan, the most important port, has great significance regarding location, physical conditions and influential economic role. This position is evident not only from the volume and spread of its traffic from the variety of incoming and outgoing goods, but also from the number of overseas connections and coastal transport. The steady growth and development of the nation's economy meant a parallel development of Busan Port as the port for the import and export of industrial products with regard to its international trade routes, particularly for trade with southeast Asian countries. The total area of both harbours (inner and outer) is 18,253 square kilometres and a total of 82 vessels can be accommodated simultaneously in the port. For the past several years it has handled over 25% of the total seagoing traffic of Korea, and has been the dominating port for general cargo by sharing 45% of the total amount. This port development plan 1974-1978 will to make it the most modernized port in the country.

b. Inchun Port:

In April 1966, the Government launched a massive development including construction of a closed harbour basin entered via locks to restore its access to ocean trade routes and keep up with trends in ocean transport. This Second Tidal Basin project was completed in May 1974. Through its huge lock system, one of the largest and most advanced ports can now permit vessels up to 50,000 D/W to berth directly in the Inner Harbour. (In particular, the 10 metre tidal range has been overcome)

In 1973, the total volume of cargo traffic handled in the port reached 12 million tons, triple the volume of

1968. Compared with the 9.4 million tons of the previous year, the increase was 29%, exceeding the average growth of 24% during the last five years. Of the volume, 8.9 million tons were sea-going against 3.1 million tons of coastal traffic. Because of its location as the entry to Seoul, the capital, and its nearby industrial complexes, its share of commodities is mostly timber, oil, bulk grain and general cargo.

With the completion of the new lock system and the second tidal basin, berthing facilities in the port have increased its cargo-handling capability from 1,420,000 tons to 6,270,000 tons per year by providing 3,820 m length of quay wall and container terminal.

Status of Korean Seafarers

Kind of ship	Officers	Sailors	Total
Commercial ship	40,182	36,943	77,125
Fishing boat	16,739	45,962	62,701
Total	56,921	82,290	139,826
Employed in foreignowned ships	2,633	6,251	8,884
Total	59,554	89,156	148,710

Escap Regional Seafarers' Training Centre Establishment

At the seventeenth session of the ESCAP Committee on Trade in January 1974, the representative of the Republic of Korea offered to make the Seafarers' Polytechnical Training Centre at Pusan a regional centre for the training of seafaring personnel of the developing ESCAP countries. This offer was warmly welcomed by the Committee and the Commission, which expressed the hope that international organizations and maritime nations would lend the necessary support to the centre.

11. REPUBLIC OF VIET-NAM^{1/}

The Present Situation of the Coastal and Maritime Transport System of the Republic of Viet-Nam

Similar to the other countries in the world, the merchant marine branch in Viet-Nam plays an effective and important role in the domestic transportation and the distribution of the commodities in the country.

For the international trade, the national fleet stays at a modest level, but it is contributing greatly to the national economy by earning currency for the Government.

National Fleet

Since the end of 1974, the national maritime fleet of the Republic of Viet-Nam consists of 23 units with a total tonnage of 45,717 dwt as follows:

^{1/} Now Republic of South Viet-Nam.

1 Ocean-going ship	11,141
8 Sea-going ships	22,441
14 General cargo coasters	12,035
Total	45,717

Except for the "Viet-Nam Thu'ong Tin I", an ocean-going ship operating regularly from Viet-Nam to the USA, the services of the sea-going ships transporting irregularly general cargo from oversea to Saigon and vice versa are limited to the Far East region.

Only in 1974, for the special supply of commodities to Phnom Penh (Khmer Republic) the nine general cargo coasters operated on the Saigon-Phnom Penh route with one trip per month.

Domestic Transportation by Sea

According to the statistics, the military and civilian dry cargo transported yearly by the coastal fleet in dwt/month as follows:

1972	:	24,461.40
1973	:	18,581.50
1974	:	21,844.50

With its 11 coasters (excluding the 3 transferred for economic and military supply to Phnom Penh) of 8,868 dwt and based on the average and normal activities, the coastal fleet could ensure 3 trips/month and the volume of cargo transported could reach 25,000 dwt/month.

With the supplementary home trade fleet of 70 units in operation, which have a total loading capacity of 21,000 dwt, the cargo transportation could be done easily, even in the sudden case or increasing demand of cargo.

International Trade

Despite the favourable location in Southeast Asia for international trade development and the coast of more than 1,900 km in length with many safe and sheltered sea-ports, the marine merchant fleet of Viet-Nam has made no remarkable progress and effective importance for the prosperity and development of the national economy. The main reasons are:

As the ocean-transport fleet for international trade comprises small units (except the large ocean-going one of 11,141 dwt), it is unable to carry out regular services by adherence to the International Freight Association.

The two main companies which have the non-liner operations are the Viet-Nam Marine Lines and Vishipco Lines.

Operation and Management of Public and Private Shipping Services

In Viet-Nam, the shipping companies, like other commercial organizations, were set up in the three following forms:

Joint stock company whose capital was contributed by all Vietnamese shareholders or partially by oversea shareholders according to the investment law.

Limited partnership whose structure is similar to

the above one.

Combined or general firm whose capital comes from the government and private sectors.

The above-mentioned shipping companies are under the direction of a management board (for a joint stock company) or general manager (for a limited company) or director-general appointed by both government and private shareholders.

In each company, they have the main services:

- (a) operational and technical service which has responsibility for the pilots and crewmen recruitment, the control of marine equipment and shipping operations, the inspection of the repair and maintenance or overhaul after each sailing.
- (b) exploitation and accounting service responsible for the statistical estimates of cargo flow for sea-transport demand, the study on freight booking and chartering, the drafting and contracting of the cargo-forwarding agreements, the billing and collecting of foreign exchanges for the Government, the management of the budget and accounting for the company.
- (c) Administration and legislation service in charge of the personnel management, the public relations, the laws and regulations for the operation and exploitation of shipping. In order to exploit the ships economically, each company has studied and planned the sailing carefully, in close co-operation with the freight broker and the stevedoring agencies in the foreign ports to be visited.

Because the cost of new ships is so high, the shipping companies prefer to purchase second-hand ones in good condition.

Investment in ship building or purchasing is hazardous while the VN war continues because of the lack of goods for export and skilled officers for piloting.

The ship owners might get the loans from the Bank of Industrial Development or the Bank of Investment Development in Viet-Nam at the special rate of 12 to 15 per cent/yearly returned in 3 to 6 years if the exploitation project of the ship to be purchased looks profitable.

Finance could be obtained if the capital of the company is equal to 1/3 of the total investment.

By the Investment Law, all foreign shipping firms could receive large opportunities to invest in Viet-Nam.

Operation of Liner and Non-Liner Services

Up to now, the Republic of Viet-Nam has not adhered to any freight conference or liner conference, even the shipping firms. They have consequently no liners in service between Viet-Nam and oversea countries.

Some ships from the Vishipco Lines Company began to run the Saigon - Singapore route, but unofficially.

Most of the ships are used for tramping, including

the biggest trampster "Viet-Nam Thu'ong-Tin I" of 11,141 dwt now in service between Saigon and the United States through the intermediat ports of the Philippines and the US Gulf.

Maritime Legislation

Most International Agreements or Conventions on shipping are very fruitful for members.

The Republic of Viet-Nam has adhered to the following Conferences or Conventions:

- International Convention for the Safety of Life at Sea, 1960
- International Regulations for Preventing Collisions at Sea, 1960
- International Convention on Load Lines, 1966
- Convention for the unification of certain rules of law relating to assistance and salvage at sea (Brussels, 23 September 1910) and Protocol to amend the Convention (27 May 1967).

The Port System and Facilities

The Republic of Viet-Nam has a long coast of more than 1,900 km, running from the 17th parallel down to Cam Au and then up to Hatien connecting the South China Sea to the Gulf of Thailand.

The coast has numerous natural bays which are safe points for ships during bad weather.

The principal ports are Saigon, Nhe Trang, Cam Ranh, Qui Nhon, Danang, Vung Tau, Can Tho and vinh Long.

Port of Saigon

Saigon is the most important port of the Republic of Viet-Nam. It is situated on the river about 45 nautical miles upstream from the sea.

Saigon is located on the main route connecting Europe and Southeast Asia to China and Japan.

Saigon — Singapore	:	650 miles
Saigon — Manila	:	906 miles
Saigon — Hong Kong	:	943 miles
Saigon — Yokohama	:	2,413 miles

Sea-going ships up to 9.30 m in draft can enter Saigon port by the Long Tao River and the Saigon River which do not need any dredging work for deep channel maintenance.

The port complex has a total length of 4 km and 16 berths of 1,950 m in length for sea-going ships berthing, 25 warehouses with an area of 72,250 m², open storage with an area of 105,000 m² and 19 mooring buoys for sea-going ships discharging to barges.

For cargo distribution to provincial and regional demand, they have 3 berths of 300 m in length for inland waterways vessels, 22 warehouses for cargo storage and the railway system connects the port area to the central railway station by two branches linking with the front and rear gates of the warehouses.

For cargo-handling and harbour operations, they have trucks, cranes ranging from 10 to 200 tons, electric

fork-lifts, tug-boats, floating cranes, dumb barges, flat-deck barges, water tankers, etc.

The total number of personnel for port and harbour operation and management is 1,900.

SAIGON PORT OPERATIONS

Year	Ships called	Incoming cargo	Outgoing cargo
1965	1,946	3,964,000	754,000
1966	2,265	5,927,000	564,000
1967	2,608	7,190,000	727,000
1968	2,674	5,929,000	774,000
1969	3,114	6,952,000	1,010,000
1970	2,952	6,825,000	905,000
1971	2,705	6,553,000	961,000
1972	2,200	5,614,000	784,000
1973	1,765	4,877,000	1,022,810
1974	1,266	3,539,000	693,179

11. SINGAPORE

Current Shipping Situation in Singapore

Despite the less favourable factors, shipping in Singapore has not been adversely affected. In 1974, general cargo discharged and loaded at the wharves, Container Port and Sembawang Port was 6.0 millin freight tonnes and 3.2 million freight tonnes respectively, an increase of 13.2% and 10.3% over the previous year.

In the shipbuilding and shiprepairing industries, some signs of growth are also noted. According to the American Bureau of Shipping (ABS) Classification, about 212 ships (233,243 dwt) were built in Singapore in 1974 as compared with 122 vessels in 1972 and 152 vessels in 1973. These vessels were built according to the Rules of the International Classification Societies at competitive prices and on time deliveries.

The shipbuilding and shiprepairing industries, backed up by either private concerns or partly public concerns, continue to adapt to new technological developments and to cater for new demand requirements. One indicator is the construction of a 400,000 dwt dry dock in Sembawang at a cost of \$47 million which is the largest and most sophisticated of its kind east of Suez and west of Japan with a capacity to accommodate 477,000-ton tankers. Back-up facilities that Sembawang can offer to shipowners are also of competitive world standard.

As shipyards in Singapore grow in number, training of personnel becomes extremely important. Several leading shipyards have instituted their own training schemes ranging from apprenticeship system to skilled craftsmen.

In view of the possible reopening of the Suez Canal and the attendant navigational restrictions, there seems to be a decline in interest in the construction of super oil tankers and the trend is towards the construction of medium-sized vessels that are faster and more efficient than those of the past.

Singapore is not only a centre for shipbuilding and ship-repairing but is also a centre for oil-rig construction catering for offshore oil exploration. Lately, there has been a move to fabricate shipbuilding material and

equipment locally instead of importing them as they are cheaper than imported ones. Singapore becomes a natural choice as a base for offshore rig construction for reasons including a good labour force, an excellent harbour and adequate shipping services. Singapore-built rigs are now working off New Zealand, Australia, in the Arabian Gulf, the Gulf of Suez and throughout the waters of Southeast Asia. The rig-building industry in Singapore is supported by many companies offering labourers, welders, ship-fitters, pipe-fitters and electricians on a subcontract basis.

Operation and Management of Public and Private Shipping Companies

Neptune Orient Lines, formed in 1969, is the national shipping line in Singapore. The line is an associate member line of the Far Eastern Freight Conference (FEFC) and the Straits/Australia Conference. NOL now has a fleet of 21 vessels including bulk carriers, tankers and super-tankers, and containerized vessels, with a total tonnage of more than 500,000 dwt.

In line with the growing demand for containerization, NOL has taken the interim step to containerize its Far East (FEFC) service. Steps have already been taken to order new container vessels for use in the Far East/Europe service. NOL now operates a semi-container service between Far Eastern and European ports.

To support its shipowning and ship-operation activities, NOL has a substantial share in a warehousing and container transportation company. It has also a team of qualified manpower and priority is always placed on the development of its manpower resources.

More than 300 private shipping companies registered in Singapore are engaged in shipping business, such as shipowning, ship agency, ship brokering, ship chartering and other related shipping activities.

About 60 shipping companies are shipowners, the majority of which are foreign-owned. Encouragement is given to shipowners to register their ships in Singapore via the various incentives provided.

However, the bulk of the shipping companies in Singapore are either acting as the owners' or cargo agents. As Singapore is situated in a strategic position, an increasing number of foreign ships are calling at Singapore for load/unloading, bunkering, and shiprepairing, and this necessitate the establishment of shipping agencies to look after their operations.

Other shipping companies registered in Singapore include ship-brokering and ship-chartering which are usually foreign-owned as local expertise and know-how in this field are scarce.

Operation of Liner and Non-Liner Services

There are 21 outbound liner conferences serving Singapore, among which the Far Eastern Freight Conference is the strongest. It serves the Far East/Europe route carrying the bulk of the volume of cargo to Europe.

Between 1974 and January 1975, many shipping Conferences imposed general freight rate increases and

the reasons given were 'rising operating costs'. However, while bunker surcharges were revised downwards as a result of a decline in oil prices and general freight rate increases, the currency adjustment factors were adjusted slightly upwards due to the stronger position of Singapore currency in the market.

Although the Singapore National Shippers' Council (SNSC) was set up in September 1972 to promote and protect the shippers' interest and had been recognized by shipping conferences as a channel for dialogue and negotiation between shippers and the conferences, in practice, this has not been so. Conferences tend to fix freight rate increases unilaterally, without prior and proper consultations with the SNSC. The problem lies in the absence of proper consultation rules and procedures between the two parties.

It has been generally recognized that one of the effective countermeasures against the virtual monopoly of Conferences would be the greater utilization of more non-conference vessels which offer lower freight rates than the liner services. To attract more non-conference services, fuller utilization of cargo space to enable profitable operations is desired. The Singapore Freight Booking Centre, which is run by the SNSC, is established for this main purpose, acting as the agency for cargo booking. An intensive drive will be made by the SNSC to invite more non-conference vessels to operate in the region.

Maritime Legislation

Merchant shipping in Singapore is governed by the Merchant Shipping Act. The Act covers a wide range of matters from masters and seamen, control of shipping and shipping inquiries to construction, equipment, surveys, safety and registry of ships.

The procedure for registering ships in Singapore is simple and straight-forward and the advantages are many. One such advantage is the very low registration fee and tonnage tax. Legislation provides that the registration fee and annual tonnage tax shall not be increased for a period of 20 years from the date of the initial registration of a ship.

There is no restriction on source of recruitment of officers and crew. Recruitment of sea ratings in Singapore is channelled through the National Maritime Board which was established in 1972 when the National Maritime Board Act was passed by Parliament and assented to by the President.

The technical requirements of Singapore flag ships are of international standards. Legislation has been effected to enable the implementation of the following International Conventions:-

The International Convention for the Safety of Life at Sea, 1960 (SOLAS 1960);

The International Regulations for Preventing Collisions at Sea, 1960 (COLREG 1960);

The Convention on Facilitation of International Maritime Traffic, 1965 (FAL 1965);

The International Convention on Load Lines, 1966 (LL 1966);

The Simla Rules, 1931.

For ships which fall outside the scope of the above-mentioned Conventions, Singapore has enacted further legislation in the interest of safety at sea. The Merchant Shipping (Non-Convention Ships) Safety Regulations, 1971 govern vessels to which SOLAS 1960 is not applicable; while the Merchant Shipping (Load Line) Regulations, 1971 (Chapter III) provide for ships to which LL 1966 is not applicable.

For purposes of ship registry, Section 401 of the Merchant Shipping Act stipulates that the tonnage of ships ascertained under the rules and regulations of any maritime nation may be accepted. This obviates the necessity to have the ships dry-docked and re-measured and consequently saves the shipowners considerable expense. For the convenience of shipowners, six international classification societies have been appointed to survey Singapore ships and issue certificates on behalf of the Government. Surveyors from the Marine Department are also available if required.

To make it attractive for banks and financial institutions to finance Singapore ships under the Singapore flag, the legislation on ship mortgages came into force on 26.2.71, containing the following provisions:

- (a) A mortgagor is obliged to disclose, in writing to the mortgagee, the existence of any maritime lien, prior mortgage or other liability before executing the mortgage;
- (b) A mortgage may be executed on a ship holding a provisional certificate of registry;
- (c) A mortgage executed outside Singapore may be recorded by the Registrar of Ships in Singapore;
- (d) The interests of the mortgagees are protected through a system of registering mortgages, and any interested parties may inspect the register book in Singapore. Alternatively, a certified copy of the transcript of Register may be provided.

The Income Tax (Amendment) Act 1969 declared that, with effect from 1.1.69, profits derived by shippers' enterprises from the operations of Singapore-registered ships are exempted from tax in Singapore.

As at 1 July 1974, there were 511 ships totalling 2.8 million gross tons on the Singapore Register.

Co-operation with Other Countries

At the national level, shippers' councils in the ASEAN countries convened the first ASEAN Shippers' Councils' meeting at Manila on 7-8 October 1974 to work out negotiation strategies and to formulate a joint ASEAN stand against the FEFC. At this meeting, it was decided to form a consultation machinery, known as the 'Federation of ASEAN Shippers' Council, to negotiate with the Conferences. The result was the birth of the Federation of ASEAN Shippers' Council on 8 October 1974.

The joint efforts of the ASEAN Shippers' Council have achieved some success in the concessions given by the FEFC to lower its proposed freight rate increases from 26% to 18%, effective 1.1.75, as well as provisions

for application by countries for special treatment for some specific commodities.

Recognizing the importance of establishing closer co-operation among ASEAN countries on shipping, the Permanent Committee on Shipping (PCS) was formed in 1969 with the main objectives of safeguarding the common ASEAN maritime interest and promoting greater participation in shipping and trade. Several PCS meetings had been convened. To facilitate the implementation of some of the recommended projects, five Expert Groups were established which are directly responsible to the PCS, concentrating on the areas of bulk shipping, marine pollution, containerization, shipping statistics, and rescue of survivors of ship accidents.

12. SRI LANKA

Introduction

Sri Lanka's geographical location was important to nations, either the belligerent or the mercantile, and the emergence of these, twin factors run almost parallel to the beginning of civilization in the island dating back to about twenty-six centuries ago. The relative importance of these factors differed from time to time. The advantages of this location in relation to trade and shipping cannot be over-emphasized and it is, however, unfortunate that these advantages were not capitalized until recently in order to become an active partner in the field of shipping. Nevertheless, agency activities in relation to shipping were in existence since the early twentieth century.

The formation of a shipping line operating its own vessels was a comparatively new development. Definite steps were taken around 1969 to establish a joint venture with government and private participation. In 1971 this was converted to a government statutory organization, namely Ceylon Shipping Corporation (CSC). Taking over of the shares held by the private sector reveals the lines of development that are parallel to other economic development measures undertaken by the Government and hence development of merchant marine with complete state participation is synonymous with that of government policy. Within a short span of four years, state participation, with a definite set of rules governing private sector concerns, has proved to be effective and successful. Emanating from these principles a coherent and viable policy of shipping is originated and developed.

The Establishment of State-Owned Shipping Organisation:

The establishment of the national carrier, the CSC, took place in June 1971 after the enactment of necessary legislation in the National State Assembly. As owner-operator of the Government's fleet, the activities of the CSC are mainly the implementation of government policy in the development and sustenance of a merchant marine. Effectively, this means: (a) development of liner services; (b) development of non-liner activities.

At present CSC operates regular liner service from Sri Lanka to UK/Continent. CSC also operates on the route between Sri Lanka and the People's Republic of China on a regular and frequent basis. In addition, CSC has obtained membership of various Conferences/Rate Agreements in order to participate in the trade wherever possible, especially when vacant space is available on the aforementioned trade routes. Holding membership rights in various Conferences/Rates Agreements have paved the way for the national line to study the mechanism of Conference operation, especially in rate-making procedures and the rate structure. CSC is also used as a vehicle for representing the national interest in Conference negotiations or as a listening post for monitoring conference affairs. CSC's stand-point in conference matters reflects a combination of viable commercial policy and national interest in regard to trade. Like most other national lines, CSC has to respond to both domestic politics as well as pressure of international competition.

The non-liner activities of CSC mainly include ship agency work, acting as sole chartering agent for bulk shipments consigned by government departments or statutory corporations and other ancillary shipping activities such as ship repairs, ship chandling etc. through either fully-owned or partly-owned subsidiary organizations. In regard to agency work, CSC handles, among other agencies, some important reciprocal agencies of national lines in the adjacent area such as National Shipping Corporation of Pakistan and Neptune Orient Lines of Singapore.

In addition CSC has reciprocal agency arrangements with other national/established lines, such as Mitsui O.S.K. Lines of Japan, Messageries Maritimes of France and Iraqi Maritime Transport Company of Iraq. Apart from activities connected to accredited agencies, CSC handles the ad hoc calls made by vessels belonging to various lines by virtue of an act passed in the national State Assembly which has specified that all new agency work in respect of either regular or ad hoc vessels should be handled by CSC or its subsidiary concerns.

As sole chartering agent for the government departments and statutory corporations, CSC calls tenders for charter vessels on a world-wide basis on behalf of these importing organizations. Such shipments under charter include bulk consignments such as rice, flour, sugar and fertilizer.

The ship repair activities are of recent origin (1974), as far as the state sector is concerned, and these are carried out by CSC's fully-owned subsidiary, Colombo Dockyard Ltd. The ship-chandling activities of CSC are carried out by its subsidiary, Ceylon Shipping Lines Ltd. These two subsidiary organizations, apart from serving the needs of CSC itself, undertake assignments and orders from various other firms, including foreign concerns, thus providing a valuable contribution towards the overall growth of shipping activities in Sri Lanka.

Another distinctive activity of CSC is the commencement of operation of a tanker service. In this direction CSC formed a joint venture in the year 1974, with equal participation by Ceylon Petroleum Corporation. This service fulfils part requirement of import of

crude oil for the state refinery of Sri Lanka. This company owns a 30,000 DWT tanker and it is intended to purchase another five vessels of similar size, which will include a couple of new buildings. The import of crude oil is at present from the Persian Gulf area.

Sri Lanka's Efforts in the Development of Shipping:

An analysis of the recent efforts could be made under the following categories:-

Capital development:

- (a) Acquisition of vessels;
- (b) Port development;
- (c) Establishment/improvement of repair and docking facilities etc;

Legislative support:

- (a) Establishment of Central Freight Bureau;
- (b) Establishment of Shipping Fund;
- (c) Licensing of Shipping Agents Act;
- (d) Cargo channelling;

Educational efforts:

- (a) Establishment of Marine Academy;
- (b) Proposed Naval Academy;

Global involvement:

Active participation in world bodies, such as UNCTAD and IMCO.

1. Capital Development

Within a relatively short period of four years (December 1971 to January 1975), the National Line has acquired seven dry-cargo vessels and one oil tanker. The acquisition of vessels is overwhelmingly guided by the availability of credit facilities on reasonable terms and conditions. Hence, the priorities regarding the size, capacity and the speed of the intended acquisitions are governed by the availability of credit when markets offer suitable tonnages. The ability to pay the down payment is restricted and accordingly, for the present, CSC is able to pay about 20 per cent of the purchase price of the vessel. The balance will have to be paid from a loan arrangement.

Currently, these loan arrangements have been limited to private institutions and it is unfortunate that any world body concerning the development of merchant marine, specially in developing countries, has not been able to render assistance in the sphere of acquisition of new or second-hand vessels for the national carrier.

The development of port facilities at Colombo as well as at Trincomalee are being carried out in stages and it is hoped that with the re-opening of the Suez Canal, these ports will be able to handle a bigger tonnage than at present. A container berth is being constructed at the port of Colombo in order to cater for containerized cargo, although the advent of containerization has not taken its full sphere in the ports of Sri Lanka mainly due to the high cost involvement, unsuitability of the majority of export cargo for containerization and the relative cheapness of palletizing cargo etc.

Development of ancillary shipping activities, such as improvement of repair and docking facilities, is another important aspect undertaken by Sri Lanka in her efforts

to develop the field of shipping. In this direction, the formation of the wholly owned subsidiary of CSC towards the latter part of 1974, namely, Colombo Dockyard Limited (CDL), is an important landmark in the annals of shipping in Sri Lanka.

The following objectives are envisaged in its overall plan:-

(i) to provide a comprehensive and modern ship repair service;

(ii) to manage and operate the dry docks in the port of Colombo, which was owned by the Colombo Port Commission; to expand and modernize the existing facilities available for docking of vessels by the construction of vessels capable of berthing larger vessels.

(iii) to undertake the construction of trawlers, tugs, dredgers and barges (for domestic use and export).

Since a large layout in terms of foreign capital is required and there is a paucity of foreign exchange available for its effective implementation, foreign capital participation has been included under the development plans of CDL. However, the effective control of this company will be in the hands of CSC. It is expected that this company will yield positive results under proper management. The formation and expected development of CDL is considered significant when ship repairing and other ancillary services are increasingly expensive in the developed countries.

2. Legislative Support

The establishment of the Central Freight Bureau of Sri Lanka (CFB) in the year 1973, as a statutory body is one of the prime conditions created by legislative support in order to help the development of export shipping in Sri Lanka. Within the two years preceding the year 1973, this organization worked under the aegis of the Shippers Council of Sri Lanka.

The objectives of the CFB as enacted under Sri Lanka Law No. 26 of 1973 are as follows:

- (a) to provide for a central freight booking office for allocation of freight space on any ocean going vessel, in respect of goods produce and merchandise of whatsoever class or description that shall be shipped from any port in Sri Lanka to any destination outside Sri Lanka;
- (b) to ensure the aggregation of goods, produce and merchandise of whatsoever class or description that shall be shipped from any port in Sri Lanka to any destination outside Sri Lanka with a view to ensuring economic loads to ocean going vessels calling at the port of Sri Lanka;
- (c) to rationalize the frequency of calls and the availability of vessels for the carriage of goods, produce and merchandise of whatsoever class or description that shall be shipped from any port in Sri Lanka to any destination outside Sri Lanka;
- (d) to arrange for the carriage of goods, produce and merchandise of whatsoever class or description that shall be shipped from any port

in Sri Lanka to any destination outside Sri Lanka;

- (e) to take such measures as are necessary to ensure efficient and regular services for the shipment of goods, produce and merchandise from any port in Sri Lanka to any destination outside Sri Lanka;
- (f) to foster the development of the national merchant fleet;
- (g) to improve port performance, loading rate in the ports of Sri Lanka, the handling of cargo and other matters connected therewith or incidental thereto.
- (h) to negotiate with shipowners and shipping lines, individually or collectively, on matters such as freight rates, surcharges, adequacy, frequency and efficiency of shipping services and matters incidental thereto;
- (i) to enter into agreements with shipowners and shipping lines, individually or collectively, either on its own or on behalf of shippers, and arrange for the carriage of goods, produce and merchandise of whatsoever class or description that shall be shipped from any port in Sri Lanka to any destination outside Sri Lanka;
- (j) to reduce costs incurred by shippers;
- (k) to obtain most favourable freight rates and terms for the carriage of goods, produce and merchandise of whatsoever class or description that shall be shipped from any port in Sri Lanka to any destination outside Sri Lanka;
- (l) to undertake research on shipping and freight rates; and
- (m) to do all such other acts or things as are necessary for or incidental to the attainment of the objects herein before mentioned.

The progress that CFB has been able to achieve during a short period is enormous so much so that some foreign countries have already sent delegations to study the operation of CFB. The rationalized services provided by the Bureau tremendously helped the shippers and the lines concerned alike. With the formation of CFB, granting rebates to obtain the shippers' loyalty towards participating lines of Conferences have become null and void. The Bureau allocates cargo to vessels offered by lines giving priority to Conference/Rate Agreement vessels and obtaining dispensation for other outside vessels as and when required, in a non-discriminatory manner. The rationalized services and the allocation policy have helped improve the turn-round of vessels and the bunching effects of vessels awaiting to obtain cargo has been completely eliminated.

In the sphere of Conference negotiations, the Bureau has been able to provide a valuable service especially in relation to general freight increases, non-traditional exports, the computation and application bases for various surcharges like Currency and Bunker Adjustment Factors etc. According to the Act, CFB is empowered to discuss and negotiate all matters pertaining to export shipping in Sri Lanka. However, it is not a body that has statutory power to make comprehensive Sri Lanka government supervision of international freight

rates; it is a body that is intended only as a check on freight rates which are irrational or harmful to the export trade of Sri Lanka. It is a well-known factor that the Bureau has been able to persuade the shippers to accept justified freight increases when certain commodities were not moving due to the fact that those rates were previously intolerably low for shipowners to provide an economically viable service.

The establishment of the Shipping Fund is also another significant step taken by the government of Sri Lanka. According to the Act which has given birth to this fund, $\frac{3}{4}$ per cent of the total freight arising in Sri Lanka has to be credited by all lines/agents to the external account maintained by the Fund. It is envisaged to utilize these monies towards the purchase of vessels with a view to operating them on hitherto "unprofitable" areas or where inadequate services were provided.

The Licensing of Shipping Agents Act of 1972 is another legislative measure created to help improve the "shipping atmosphere" in Sri Lanka. These regulations which spelled out the requirements to be eligible for a licence to carry on business as a shipping agent provided, *inter alia*, that no licence shall be issued (a) to any company which had direct or indirect links with the business of shipping or of exporting from Sri Lanka or (b) if all the shares of the applicant company are not owned by citizens of Sri Lanka. However, the regulations also provided, that an applicant company which has direct or indirect links with a company engaged in the business of exports, or the shares of which are not owned fully by citizens of Sri Lanka, shall be eligible for licence, provided not less than 51 per cent of the shares of the applicant company is owned by citizens of Sri Lanka, and further, that not less than 30 per cent of all the shares of such company is owned by the CSC. In terms of these regulations and provisions, CSC has been able to obtain 40 per cent of the shares of each of four companies.

The system of channelling cargo consigned to government departments and statutory corporations on CSC vessels has been practised since 1972. The scheme is restricted to areas where regular services are being operated by CSC. The governmental controls exercised by statutory requirements envisage that cargo consigned to government departments and statutory corporations are shipped on CSC vessels. However, if no CSC vessel is available within a reasonable period of time, the cargo will be carried by any other Conference/Rate Agreement vessel available. It is worth-while to note that this scheme is implemented without jeopardizing the interest of the trade. While the scheme is limited to liner cargoes, its effective enforcement has proved the success of governmental regulations. At present a usual regulatory technique of placement of large government contracts on state-owned vessels is not followed. However, if cargo under such contracts are being imported when CSC vessels are available at a particular loading port, those may be lifted.

Another aspect of the cargo regulatory scheme practised in Sri Lanka is the control of freight rates and services through bilateral trade agreements restricting shipment of covered commodities to the vessels of the

trading partner. This method is practised only in respect of cargo originating to and from Sri Lanka to the People's Republic of China.

3. Educational Efforts:

The establishment of a marine academy at Trincomalee was effected to provide training facilities for intended seamen. Hitherto, the ranks of seamen in the fleet owned by CSC were usually filled from among the candidates of the Sri Lanka Navy. However, it is hoped that this over-dependence in regard to supply of seamen will be rectified through the training scheme provided at the marine academy.

It is also envisaged to establish and develop a naval academy to train officers and engineers. At present the national carrier experiences a dearth of certificated and experienced engineering and deck officers to man the vessels owned by CSC. It has been felt somewhat difficult to attract Sri Lanka officers who are lucratively employed abroad to man CSC vessels. However with the exception of a couple of officers CSC is fortunate to have received the support of Sri Lankan officers who have decided to serve Sri Lanka after resigning from their foreign employment.

The lack of qualified personnel for employment ashore has been a perennial problem for developing countries including Sri Lanka. It is expected that with the necessary assistance from global institutions, the required manpower will be made available within the next decade or so.

4. Global Involvements:

The Sri Lanka Government as a member of world bodies such as UNCTAD and IMCO has actively supported multilateral regulatory mechanisms. A significant feature under this aspect is Sri Lanka's positive involvement in formulating and supporting UNCTAD in its efforts to develop a minimum code of fair practice for liner conferences.

In conclusion, mention should be made in regard to the assistance granted towards developing countries in the field of shipping. Hitherto there has been substantial activity in regard to enforcement of various instruments — Bills of Lading, Charter Parties, Code of Conduct etc. There is also positive action in regard to safety at sea, pollution of the sea-bed and environment etc. However, one could think whether a regional or a world body, assisting the development of merchant marine in the form of physical acquisition of assets i.e. vessels needed by developing countries, could be formulated. The developing countries' share of world tonnage is relatively decreasing in comparison with that of the developed countries. One could also believe that a world body would be able to help determine the future size of vessels/fleet requirements of developing countries, especially in relation to the vast technological changes taking place in the developed countries which have a significant impact on the trade and shipping of the entire world.

13. THAILAND

Thailand has an extensive sea-borne trade which in

1974 amounted to about 10.5 million metric tons (excluding domestic trade and petroleum products), but the Thai flag fleet although long established is among the smallest in the region.

Three principal Thai shipping companies own and operate 13 ships plus additional tonnage under charter. The companies and their fleets are as follows:-

Thai Mercantile Navigation Co. (TMN) is the state national shipping line operating under the control of the Ministry of Communications. This company operates within the Thailand/Japan Conference and the Japan/Thailand Conference and in addition operates between Bangkok, South Thailand ports and Singapore. The company is also required to operate, on behalf of the Government, a shipping service to Mecca for the Muslim Thais who mainly live in the southern sector of the Kingdom.

T.M.N. fleet

Name of ship	g.r.t.	Date built	Service speed (knots)
1. Nakhorn Thai	3,635	1965	12
2. Samut Prakan	3,428	1958	12
3. Sri Chol	3,366	1968	12
4. Sri Maharach	4,122		12
5. Sri Thep	3,635	1965	12
6. Nakhorn Thon	6,535		14
7. Samut Sakhon	2,558	1957	12
8. Samut Songkhram	1,941	1959	12

Consideration is now being given to the purchase of 4 additional ships.

In 1974, TMN carried 243,231 freight tons of cargo.

Thai Mercantile Marine (TMM) is a Thai commercial shipping company which owns 2 ships and has 3 under charter. The company operates within the Thailand/Japan Conference and the Japan/Thailand Conference.

TMM fleet

Name of ship	g.r.t.	Date built	Service speed (knots)
1. Kasem Samut	5,044	1958	16
2. Pichit Samut	3,354	1954	13½

In 1974, TMM carried 136,650 freight tons of cargo.

The third Thai shipping company is *Thai International Maritime Enterprises* (TIME) with a fleet of 3 ships owned by the company and 2 under charter. This company also operates within the Thailand/Japan and Japan/Thailand Conference.

TIME fleet

Name of ship	g.r.t.	Date built	Service speed (knots)	Usual service
1. Krung Dheb	4,999	18/1957	14	
2. Krung Siam	4,451	18/1957	12	Thailand-Japan
3. Krung Thai	4,891	17/1958	12½	

In 1974, TIME carried 138,543 freight tons of cargo.

Thailand also has a number of domestic trade tankers and cargo ships and the Thailand Ocean Transportation Co., Ltd. have two foreign-going tankers as follows.

ss Bangkok	Built 1955	33,537 g.r.t.
ss Siam	Built 1955	33,635 g.r.t.

Legal provisions relating to ownership of Thai merchant ships

The registration of Thai ships is governed by the Thai Vessel Act B.E. 2481 and also by the Law on Thai Navigation Waters Act B.E. 2456. Companies or persons who wish to operate foreign-going ships must be registered with the Ministry of Commerce. A Thai shipping company must have 70% of the share capital owned by Thai nationals.

Relations with the shipping conferences.

Thai ships have an unlimited share of the sailings from Thailand to Japan, but the large majority of cargo consists of low freight primary products, such as maize and tapioca. In the Japan/Thailand conference, the sailings allocated to Thai flag vessels are limited, but negotiations over the years have managed to get the Thai share increased — viz:-

SAILINGS JAPAN/THAILAND CONFERENCE

	TMN	TMM	TIME	Total
1971	36	24	18	78
1972	56	32	22	110
1973	60	36	24	120
1974	60	36	24	120

Problems facing the Thai shipping industry

As will be seen from the above, the Thai fleet is still relatively small in comparison with the foreign trade cargo flows. Lack of capital has imposed the major constraint on fleet expansion, and the tendency is to acquire second-hand conventional tonnage of five or more years of age, rather than invest in the high cost of new, or nearly new, specialized tonnage, such as container, combo, ro-ro or large bulk carriers.

Consideration has been given to entering into the Thailand/Europe/Thailand shipping trade, but the uncertainty of the cargo share to be secured by Thai flag vessels has deterred the companies from making the necessary investment in the ships. However this subject is still under consideration.

The number of Thai nationals with highly-developed shipping management skills is still relatively small, and the same applies to ship-borne personnel, although it is hoped that the plans for the new merchant marine academy will eventually overcome the shortage of ships' officers.

Regional co-operation

Regional co-operation in the field of joint venture

shipping services is considered to be highly desirable, and this particularly applies to the operation of feeder containerhips, feeder lash vessels (FLASH) and bulk carriers where the capital investment is high and there is need for special management expertise.

Thai Shipowners Association

Until very recently the only association representing

shipowners in Thailand was the "Bangkok Shipowners and Agents Association", but the members are predominantly foreign shipowners using the Port of Bangkok, or their agents. In order that Thai flag shipowners can be represented on a national basis, the Ministry of Communications recently invited representatives of the national flag ships to form a Thai Shipowners Association and the Articles of this Association have now been drawn up and are expected to be adopted and approved in the near future.

