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**STRUCTURAL CHANGES IN OCEAN-LINER TRANSPORT:  
PROSPECTS AND IMPLICATIONS FOR  
POLICY FORMULATION**



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## SUMMARY

### I. INTRODUCTION

The crisis environment in which the ocean-liner industry has operated for the last decade is due to the ongoing evolution of forces that are structurally transforming non-system, independent, remotely-deployed liner companies into ever more integrated distribution systems. Unless they appraise the causes of these changes, shipping executives may act on assumptions that are out of date.

As this document seeks primarily to stimulate discussions, the accuracy of the predictions in it is of secondary importance. Only the future will provide conclusive answers to the statements made and the questions presented.

### II. SERVICES

If carriers are to remain viable, ocean-liner transport has to be approached differently and the areas of structural change, affecting service, market, technological and legal aspects must be correctly interpreted.

#### A. The impact of market forces on homogeneous liner cargoes

During the early history of ocean-liner transport all cargoes were carried by liner vessels -whether they were grains, minerals, petroleum, passengers or what is today referred to as general cargoes. When the above homogeneous cargoes reached appropriate volumes, they were separated from ocean-liner transport and carried in specialized vessels under contractual or charter arrangements. Petroleum is illustrative of this separation. With the ever-widening use of containers, general cargoes now present a homogeneous transport unit and their possible separation from ocean-liner transport must be evaluated in the light of the existing structure of ocean-liner transport, the volume and balance of containers in movement, and the service frequency required by cargo owners.

#### B. The interchangeable nature of container transport services and its impact on conferences

Historically, conferences provided market stability for investments and income security, but due to structural changes in the industry they have become a source of insecurity for carriers. Because of the growing use of containers, most companies operating cellular vessels are no longer involved in handling and stowage of general cargoes. While liner operators have come to offer numerous other services to cargo owners, such as computerized container location systems, the transfer of handling and stowage services to factories and interior cargo terminals has eliminated the unique nature of each line and made them undifferentiated and substitutable.

### C. Intermodalism and the growing use of landbridges

Intermodal transport today implies a system approach to all the activities and functions in the distribution chain, in order to reduce or eliminate interruptions in the continuous movement of goods from origin to destination. The "systems optimization" of intermodalism provides a total, rather than fragmentary, view of all activities in the distribution chain. The change from "modal optimization" to "systems optimization" brings about the integration of all functions - lines, ports, Customs, land transport, interior cargo terminal, shippers and consignees. This integration has brought about a growing use of landbridges.

The impact of landbridges and intermodalism on the demand for ocean-liner services will be enormous, but the potential impact on vessel designs, trade routes and trading economics could be even greater. Due to a possible decrease in demand for liner services caused by the growing use of landbridges, one must ask if the liner industry is on the threshold of a world fleet reduction similar to that which occurred when cellular ships displaced their general cargo counterparts?

### D. Large-scale vessels

When selecting a vessel for an ocean-liner service, costs, physical limits of ports/canals and trade requirements are normally considered. Large vessels permit the growth rate of operating cost to be kept below that of freight rates. However, in a market with declining trade volumes, the matching of the vessel cargo levels needed to achieve an adequate return on investment with the frequency requirements of shippers and consignees may become impossible.

### E. Load centering

The trend toward load-center ports could have a distinct impact on east/west and north/south trades. The reasons for this are related to the types of cargoes in movement, balance in flows, seasonality, installations of and distances between ports, and inland transport infrastructure. For example, east/west trades are reasonably balanced with large flows of high-value cargoes, but north/south routes are unbalanced, seasonal and composed of low-value cargoes. East/west trades are generally between industrialized countries which have numerous, well-equipped ports and extensive inland transport systems. In contrast, the southern end of north/south trades lacks such ports and land transport systems, which for the foreseeable future would seem to preclude load-centering.

### F. Overtonnaging

Between 1970 and 1984 world seaborne trade grew by 32 per cent, while the size of the world merchant fleet increased by more than 100 per cent. Overtonnaging is caused not only by an excess of vessels but also by their increased productivity. Some form of joint action would appear appropriate to deal with the common threat of overtonnaging. Due to the enormous number of institutions, governments, lines, shipbuilders, banks, etc., and the

## PREFACE

With financing provided by the Government of the Netherlands, the Transport and Communications Division of ECLAC has undertaken studies of the market, service, technological and legal forces which are restructuring not only the ocean-liner industry but also its land transport counterpart. The preliminary results of the ocean-liner study were published in a document entitled Structural changes in ocean-liner transport and the challenges facing Latin America and the Caribbean (LC/R.523) and distributed to numerous industry specialists for comments and suggestions. The present version reflects not only the topics presented in the original document and the observations received from industry experts but also the continuing studies of ECLAC in the field.

In the changing world of ocean-liner transport, strategic planning is a must, but it is not enough. Planning implies undertaking activities which will assist in reaching preselected goals. To correctly identify such goals, strategic planning must be based on an in-depth understanding or strategic vision of the forces -market, service, technological and legal- which are changing the industry. A strategic vision of the ocean-liner industry would provide at least partial answers to the questions: What do such forces mean for a specific line, country and region? and what measures should be taken in response thereto? In order to contribute to such understanding this document has the following objectives: (1) to provide a simple framework for dealing with the dynamic, evolving environment of ocean-liner transport during the latter part of the twentieth century, (2) to identify directions in which the industry is moving and (3) to make suggestions for policies and plans the Latin American and Caribbean countries might consider.

## I. INTRODUCTION

To say that ocean-liner transport is in a recession or even a depression is an obvious understatement when viewed from the perspective of the crisis environment in which the industry has operated for the last 10-12 years. It is a crisis brought about by the on-going evolution of forces that are structurally transforming non-system, independent, remotely-deployed liner companies into ever more integrated distribution systems. The transformation is so profound that the characteristics of the industry, its fundamental purpose and even the goals sought appear to be changing. Shipping executives are aware of the elements which make up the crisis environment in which they operate, but many seem unaware that such elements are neither isolated nor unrelated and together constitute a discernible pattern which is restructuring the industry and must be understood for survival.

Without an appreciation of the market, service, technological and legal forces which are restructuring the ocean-liner industry, shipping executives may formulate and act on strategies, policies and plans that are out of date. If industry leaders are out of touch with the present, how can they understand and deal with the unfolding future? Trends are not destiny, and if anticipated they can provide substantial opportunities. The decisional flexibility that trend anticipation provides in the short term can become decisional paralysis in the medium and long terms if such trends are not understood and properly utilized. Trend anticipation permits shipping lines to avoid forced choices and can reduce or eliminate the seemingly inevitable nature of the future.

In the ever-changing field of world trade and ocean-liner transport, many long-term projections of the early 1970s, and decisions made thereon, have become almost irrelevant to the situation in the mid-1980s. Despite the assistance of computers, cluster diagrams, mathematical models and matrices, any attempt to look at the future necessarily remains more of an art than a science. During a period of structural change, planning must be based on something more than historical trend analyses and projections, as the mechanical application of these tools can result in mere extrapolations of already fossilized events. This is not to say that such analyses and projections are not useful, but rather that they provide their greatest benefits when guided by an in-depth understanding or strategic vision of the industry and the market; service, technological and legal forces which are restructuring it.

To identify the trends presented in this document, extensive use was made of the insight, vision and seasoned judgement of numerous industry specialists. Based upon the information provided by them, the central message of this document is not only that yesterday's ocean-liner structure is coming to an end but also that the ideas put forward about tomorrow's structure will not last forever either. As all attempts to look at the future are invalidated in some respects by subsequent events, accuracy of predictions is of secondary importance to the broader issue of stimulating discussions. Indeed, when dealing with the future the fundamental goals sought are to make approximately correct assumptions and to formulate appropriate questions to bring about reasoned, constructive and, hopefully, convergent discussions. In seeking to provide a framework for discussions, this document cannot and does not rest with generalizations, but rather takes



considerable risks by making declarations and asking specific questions for which only the future can provide conclusive answers.

## II. SERVICES

In a time of structural change, ocean-liner transport must be approached differently if carriers are to remain viable. However, what that approach might be will be determined by a correct interpretation of the service, market, technological and legal forces which are bringing about such changes. While all of these forces contribute to the restructuring of the ocean-liner industry, some of the more important aspects in the services area are related to (a) the impact of market forces on homogeneous liner cargoes, (b) the interchangeable nature of container transport services and its impact on conferences, (c) intermodalism and the growing use of landbridges, (d) large-scale vessels, (e) load centering, (f) overtonnaging and (g) ocean-liner and commercial concentration.

### A. The impact of market forces on homogeneous liner cargoes

Ocean transport can be divided into two types of services. First, liner services are offered by vessels which sail along fixed routes on preannounced schedules and transport general cargoes. Liner operators providing services within a defined geographic trade historically have been organized into conferences, the main purpose of which is the establishment of standard rates and limiting of competition. This part analyzes the impact of market forces on homogeneous liner cargoes, whether transported by conference or non-conference vessels. Second, tramp, contract or charter services are provided by vessels which offer their capacity for the carriage of cargoes such as grains, minerals, petroleum, lumber, paper, pipes, automobiles and sugar. While shippers utilizing liner services usually occupy only a small part of the capacity of an entire vessel, shippers employing tramp services often engage the whole of a ship. With the growing use of time-volume rates, service contracts and slot-charter arrangements in ocean-liner transport, the differences between liner and tramp carriage have become less distinct. Shippers of both liner and tramp cargoes can utilize the transport capacity of a vessel for one or a series of carriage operations.

If one begins with the age of modern ocean-liner transport, which started with the development of the steam engine and establishment of the liner conference system during the 1860s, the impact of market forces on homogeneous liner cargoes can be clearly seen. During the early history of ocean-liner transport all cargoes were carried by liner vessels -whether they were grains, minerals, petroleum, passengers or what is today referred to as general cargoes. However, when the above homogeneous cargoes and others such as automobiles, pipes, paper rolls and lumber reached appropriate volumes, they were spun-off or separated from ocean-liner transport and began to be carried in specialized vessels under contractual or charter arrangements.

The ocean carriage of petroleum is illustrative of the spin-off or separation of homogeneous cargoes from liner transport. It will be recalled that the units of transport utilized for petroleum in general cargo vessels were either barrels (which are still used as a unit of account for crude petroleum) or metal four-gallon cans, two to a case (hence case-oil).

Although there had been a few earlier conversions, it is generally accepted that the first purpose-built ocean-going vessel for the carriage of oil in bulk, the Gluckhauf --which means "Good Luck" in German-- (3 070 deadweight tons), was launched on 16 June 1886. There were difficulties with early tankers, such as leaking from rivetted bulkheads, but the carriage of oil in bulk rapidly undercut the rates for its transport in barrels and cans, and by 1889 over 40 tankers had been constructed. By 1890 there were two main routes, from Batum on the Black Sea to either Liverpool, Antwerp, Bremen, Hamburg or Amsterdam, and from either New York or Philadelphia to those same ports. With only very minor exceptions, since 1890 the transport of this homogeneous cargo has been largely carried out in specialized vessels under charter arrangements.

It is worth noting that vessels which reduce shore-labour requirements are seldom immediately accepted by stevedores, and the Gluckhauf was no exception. Soon after her delivery on 9 July 1886 she arrived in Philadelphia and loaded 2 880 tons of petroleum. The stevedores at that port mounted a violent protest against the vessel, as there were no barrels or cases of oil for them to handle, and they tried to prevent her receiving any coal for the return voyage. It was well into the following month of August before the Gluckhauf was able to sail for Europe. As a result, the vessel's owner had her bunker capacity enlarged to enable sufficient coal to be carried for the round voyage.

General cargoes have resisted this trend due to their non-homogeneous nature and the need to handle and stow each individual unit. However, with the ever widening use of containers general cargoes now form a homogeneous transport unit. The possibility of a spin-off or separation of containers from ocean-liner transport and their carriage in specialized vessels under contract arrangements must be evaluated. While there are many factors that should be taken into consideration, some of the more important are (1) the structure of ocean-liner transport, (2) the volume and balance of containers in movement and (3) the service frequency required by cargo owners.

1. The structure of ocean-liner transport. The separation of traditional homogeneous cargoes such as grains, minerals and petroleum took place when the demand for a specific commodity created the basis for its volume carriage and this, in turn, led to the design and construction of specialized vessels. The volume transport of such cargoes also created the need for specialized inland distribution systems. For example, the volume carriage of grains required the establishment of origin-to-destination distribution systems to protect them from hazards such as contamination, handling losses and spontaneous combustion. Similarly, petroleum and its derivatives are products which require specialized distribution systems to protect from contamination not only the cargoes but also the environment. In addition to the design and construction of specialized distribution systems, it was necessary to create a supporting institutional infrastructure and provide training for those working in incipient industries which had almost no earlier antecedents.

Ship operators involved in the transport of traditional homogeneous cargoes offered services on a limited number of routes and between single loading and discharge ports. With growth in demand for such commodities and establishment of distribution systems the number of routes has increased and certain operators, such as those transporting coal, provide multiple-port

services. Even though the number of routes and ports have increased, they are still rather limited when compared with those of liner operators.

The transport of modern containers commenced on 26 April 1956 with the departure of the Ideal X, a modified T-2 tanker with 58 demountable-truck bodies aboard, on a voyage from New York to Houston, Texas. After 10 years of service between the US East and Gulf coasts, as well as to Puerto Rico (beginning in 1958), the first international voyage of a container vessel, the SS Fairland of Sea-Land Services (SLS), took place between the ports of New York and Bremen, Germany, arriving at the latter on 5 May 1966 with 226 SLS standard 35' X 8' X 8' (10.67m X 2.44m X 2.44m) containers. Even though the container had become the accepted liner transport unit by 1970, it was not until 1972 that the first cellular vessel, the SS Galloway of SLS, was designed and constructed. Since that time ocean-liner transport has utilized specially designed and constructed vessels for the transport of containers. These vessels form part of distribution systems which include equally specialized port facilities and inland transport equipment. Furthermore, there is not only a specialized physical infrastructure for the transport and handling of containers but also a supporting institutional infrastructure, including the valuable experience of liner operators, port authorities, inland transport companies and many others.

Liner operators offer regular services on almost every conceivable route as well as multiple loading and discharge ports. This service pattern continues to be valid for operators of general cargo vessels. However, starting with the first international voyage of a container ship in 1966, and up until the early 1970s, the service pattern of vessels carrying traditional homogeneous cargoes, i.e., that of limited routes and ports of call, was utilized. With the ever-widening use of containers and the construction of appropriate port facilities, container ship operators began to increase the number of routes and ports served. However, the multiple-route, multiple-port service pattern appears to be changing. Since the mid-1970s liner operators have begun to limit the number of ports served, making use instead of intermodal-landbridge distribution systems. For example, Cast North America offers a transatlantic service only between Montreal, Canada, and Antwerp, Belgium, but reaches a large hinterland behind each port through fully integrated inland distribution systems and door-to-door service.

The existing structure of ocean-liner transport, which is composed of equipment, skills, institutions and service patterns, will obviously have an influence on whether containers will be separated from liner transport and carried under charter or contractual arrangements. Counterbalancing that influence is the growing role of non-conference carriers, the creation of new service patterns and adoption of new legal regimes (evaluated at parts II.B., II.C., and IV. of this document), which support the historical trend to separate homogeneous cargoes from ocean-liner transport. It might be argued that the existing liner structure will simply be modified to take into account the market, service, technological and legal forces that are changing the industry. Indeed, the existence of a fully-developed, specialized liner structure and the diverse needs of cargo owners would appear to support that view. Such modification could result in a spectrum of services, of which there might be three principal types: private contract services in which carriers are integrated into the production and consumption functions of cargo owners; mixed contract and liner services; and traditional liner operations. The second type (mixed contract and liner services) is already utilized on many routes through arrangements such as service contracts in

accordance with the US Shipping Act of 1984, and slot chartering by liner companies, large shippers, non-vessel operating common carriers (NVOCCs) and freight forwarders.

2. The volume and balance of containers in movement. The separation of homogeneous cargoes from ocean-liner transport has occurred historically when an appropriate volume of goods in movement has been reached. It should be recognized that even when such a volume is reached the separation may be far from complete. For example, although there are approximately 370 specialized pure-car carriers, not all automobiles are transported in them. Only on high-volume routes has the separation been complete for automobiles. Additionally, where there exist not only a sufficient volume but also a reasonable balance in container flows, or system-compatible cargoes which ensure remunerative vessel load factors, even greater support will be given to a spin-off of such units from ocean-liner transport.

The question of whether a balance in the flow of containers in a specific trade is required to support a spin-off or separation from ocean-liner transport must be understood in the light of the market towards separation of homogeneous cargoes, which usually occurs without such balance, and the possibility of utilizing flexible vessel designs which facilitate the carriage of system-compatible cargoes to reduce and even eliminate ballast voyages. In response to increasing competition among carriers and the attendant need to reduce unremunerative voyages, naval architects have developed flexible liner vessel designs which permit the carriage of a wide range of cargoes, such as lumber, grains, minerals and odd-size cargoes, while minimizing construction and operational costs. On the other hand, manufacturers often design their products not only to ensure full cubic use of International Organization for Standardization (ISO) marine containers but also to utilize shipboard container spaces, as in the case of an accommodation unit carried from Europe to the Mid-East in 112 TEU on-deck spaces of a cellular vessel.

Due to the enormous differences between individual trades served by liner operators, whether related to cargo balance, direction, seasonality, mix, volume, availability of system-compatible cargoes or number of shippers and consignees, it would be difficult to identify those routes that might be subject to a separation. Nonetheless, there are many indicators which can provide useful guidance. For example, a growing presence of dedicated non-conference carriers would be an indication that the route might have a sufficient volume of containers for a separation. Another indication might be the percentage of the liner trade covered by service contracts and time-volume arrangements. Finally, the increasing volumes of cargo handled by freight forwarders, NVOCCs and others could also lend support to a separation.

3. The service frequency required by cargo owners. When selecting a carrier, ocean-liner rates are important, but they are only one of the factors taken into consideration by shippers. Indeed, many have begun to utilize wider parameters such as total distribution costs for shipments and give considerable weight to the impact on inventory carrying cost if one line's frequency and transit time are more convenient than another's. To minimize inventory investment and holding costs cargo owners look for a continuous flow of goods which permits them to reduce the volume of goods held in inventory and, at the same time, ensures that their productive

processes will not be interrupted due to a late delivery. These frequent or "just-in-time" deliveries permit cargo owners and liner operators to establish transport systems in which a commitment to exact delivery times by carriers allows shippers and consignees to reduce the volume of goods held in inventory.

The spin-off or separation of containers and their carriage under contract arrangements should permit manufacturers, integrated trading companies and others to view transport as part of their purchasing, marketing and stock departments, with shippers, consignees and carriers jointly devising systems and procedures to reduce cargo damage and ensure timely deliveries. Shippers and consignees will seek creative and innovative transport partners who will share risks and rewards and offer total co-operation in order to obtain the objectives of safe product transport, economy, forward planning, incorporation of new technologies and expanded use of communications systems.

The trend to spin-off or separation of homogeneous cargoes from ocean-liner transport has continued without interruption since 1886, when the first petroleum tanker was constructed, and must be carefully interpreted in the light of its possible impact on containers. It could be argued that the trend towards the separation of homogeneous cargoes from ocean-liner carriage might not be applicable to containers, as they are homogeneous transport units rather than a homogeneous cargo. Another argument might be that homogeneous cargoes are usually carried for a relatively small number of shippers and consignees, while containers can involve numerous shippers and consignees. It might also be argued that the ocean-liner industry already utilizes specialized vessels, handling equipment and inland transport systems and has an extensive institutional infrastructure, whereas such infrastructures were non-existent when traditional homogeneous cargoes separated from liner shipping. Notwithstanding the cogency of these and many other arguments, numerous questions remain: Will these or any other factors be sufficient to preclude such separation? If it does occur, what will be the structure of the liner industry? Will all liner operators become contract carriers?

#### B. The interchangeable nature of container transport services and its impact on conferences

The liner conference system, which was almost universally accepted as the basic mechanism to control the industry until the late 1960s, has become increasingly unresponsive to trade requirements. Symptoms of this unresponsiveness can be seen in a number of areas, such as the failure to deal satisfactorily with overtonnaging and freight-rate fluctuations. Liner conferences have been subject to increasing criticism by shippers, but for most vessel operators they have advantages and disadvantages. Historically, conferences provided market stability for investments and income security, but due to structural changes in the industry they have become a source of insecurity for carriers. The market control mechanism of conferences has made many carriers so dependent that they do not understand the wider issues presented by the crisis, are largely inarticulate, and formulate inadequate responses to it.

Before goods began to be carried in containers, ocean-liner companies offered a package of services with four common elements - technology, route,

frequency and price. However, more important to shippers and consignees than these common elements provided by all lines were the service aspects involved in handling and stowage of general cargoes. The handling and stowage of such cargoes was an art as well as a science and required great experience to place compatible cargoes in the same hold and to stow them appropriately for the rigours of ocean carriage. Shippers were known to forego vessels of one company specifically because they knew their cargoes would be better cared for by another.

With the growing use of containers in ocean-liner transport most companies which operate cellular vessels are no longer involved in the handling and stowage of general cargoes. To an ever increasing extent these functions are carried out at interior cargo terminals and factories where containers are filled and emptied. Such a change might appear minimal, but its impact is enormous. Without the service aspects of cargo handling and stowage ocean-liner services have become undifferentiated and substitutable. Containers have not only made ocean-liner services interchangeable but also largely deprived them of characteristics which would make them individually unique. Where different shipping companies offer similar vessel technologies, routes, frequencies and prices, ocean-liner services are identical. As a result, conferences exercise much less control over carriers and shippers than in the era of general cargo vessels. In an age of interchangeable liner services, a greater degree of control lies in the hands of cargo owners, few of whom operate liner vessels, and differences between lines are a less significant factor when choosing a carrier. Probably the most important lesson to be learned from the interchangeable nature of ocean-liner services is that nowadays a shipping company does not need the 125 years of experience of Hapag-Lloyd to successfully engage in ocean-liner transport.

The growing influence of non-conference carriers and the weakening of the liner conference system are directly related to the interchangeable nature of ocean-liner services. For example, when containers were introduced into Australian trades in the early 1970s, liner conferences were estimated to be carrying slightly in excess of 90 per cent of all cargoes. By early 1987 that amount had fallen to 64 per cent. Another example is the loss of Italian traffic to non-conference Taiwanese carriers. With at least 70 per cent carried by those operators, during the latter part of 1986 the Italian Government was considering the imposition of measures which would require every item loaded on Taiwanese vessels to be authorized by Customs. However, with the announcement by Evergreen Line (EL), a Taiwanese carrier, that it would become a member of the Mediterranean/USA freight conference on 1 January 1987, such planned measures were set aside. Representatives of EL have indicated that the line operates profitably although its rates are approximately 20 per cent below those of the conferences. Due to the interchangeable nature of ocean-liner services, where competing companies offer the same technology, route and frequency, price becomes the deciding factor in the selection of carriers.

As can be seen from the following diagram, liner conferences are composed of one or more of three distinct elements: i.e., consortia, the traditional breakbulk or general cargo functions, and rate agreements.

## CONFERENCE EVOLUTION

PAST:

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| Individual |
| ship operators |
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| Breakbulk conferences |
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PRESENT:

|

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| Container conferences |
| (Consortia -- breakbulk -- rate agreements) |
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FUTURE:

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| Consolidated | | Traditional | | Brokers' |
| lines        | | conferences | | services |
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While the reasons for the establishment of general cargo conferences are well known and documented, most commentators consider that the creation of consortia and rate agreements are merely an extension of the original conference framework. However, these new arrangements have come about due to a myriad of factors such as the interchangeable or identical nature of container transport systems, new legal regimes such as the US Shipping Act of 1984, intermodalism, large-scale vessels, overtonnaging and declining trade volumes, which are exogenous to and often in contradiction with the conference system.

In this most international of businesses, shipping lines without joint operating arrangements with other ocean carriers are the exception rather than the rule. Ship operators have gone from total independence and loose combinations in the form of general cargo conferences to tighter relationships such as consortia, slot chartering and joint marketing arrangements. A consortium allows individual liner companies from one or more countries to operate as though they were one line, with each member maintaining its identity and control over certain activities such as marketing, whereas in an consolidated line (CL) participants lose their identity and permit control over activities to be carried out by a new central organization. In order to establish consortia, CLs or joint operating arrangements there must be a willingness among participating liner companies to compromise in areas such as objectives, ownership of shares, investments (types, amounts and frequency), duration and financial compensation. The need to compromise does not necessarily mean that national interests will not be satisfied, but such objectives should be evaluated in the light of national interests.

A fundamental corollary of the need to compromise in order to achieve common objectives is the requirement that participants utilize or combine the inherent advantages and least-cost factors available to each. The search for least-cost factors could give rise to CLs on a global scale. For example, the flag or even the ownership of a vessel could become meaningless when a ship is crewed in one country, managed from another, financed elsewhere and

is part of an international distribution chain which might see the ship operating between two other countries for its entire economic life. The question then becomes to elaborate how can national maritime policies in order to take into account not only national interests but also the trend towards tighter and more extensive relationships between liner operators?

If the trend towards ever tighter and more extensive relationships between liner operators continues, Latin American liner operators run the very real risk of becoming part of large CLs. Currently, vessel operators of this region are slowly being absorbed into extra-regional consortia, with the attendant risk of becoming minority stockholders or single vessel operators in resulting CLs. This could mean a loss of control over their ocean-liner activities and over the important role of shipping in trade promotion. The long-term impact of this trend must be carefully studied in order to answer numerous questions such as what is an appropriate presence in ocean-liner transport for Latin American and Caribbean countries and what would be the response of extra-regionally controlled CLs to the individual transport needs of those countries? Responses to these and other questions will help shipping lines and governments of this region to elaborate a common ocean-liner transport policy.

Rate agreements have replaced traditional conferences on numerous trade routes, especially those to and from the USA. A major reason for this is that the US Shipping Act of 1984 has given individual lines numerous new tools which enable them to respond more rapidly to shippers' requirements. These legislative tools include the right to quote independent freight rates, enter into service contracts and offer time/volume rates, all of which contradict the traditional conference structure that allows competition between its members only on service activities, never on price. Service contracts are agreements by which a shipper or group of shippers offers a certain volume of cargo over a fixed period of time in exchange for a guaranteed rate and service commitment from a carrier or conference. The gains shippers derive from such contracts are lower administrative costs, reduced inventory levels, stabilized freight rates and a reduction of errors in trade and transport documentation. On the other hand, carriers find that service contracts have resulted in liner tariffs becoming increasingly meaningless. Without the traditional conference powers to ensure compliance with standard rates and to minimize competition, rate agreements have become "talking shops" for carriers. As containers are spun-off or separated from other conference cargoes on high-volume routes, rate agreements could evolve into meeting places for owners' and charterers' brokers to negotiate and formalize contractual arrangements for the carriage of containers.

### C. Intermodalism and the growing use of landbridges

The historical meaning of intermodal transport was simply the transfer of goods between different modes, whereas today it implies a systems approach to all activities and functions in the distribution chain in order to reduce and, where possible, eliminate interruptions in the continuous movement of goods and transport equipment from origin to destination. It should be highlighted that increasing the speed of transport is cost increasing, whereas reducing the length of time goods spend waiting to move is cost decreasing. The entire distribution chain, in which ocean and land transport are merely links, has taken on greater importance as the value of the goods carried has increased. Intermodalism is an integrative way of dealing with



the distribution chain to increase its potential. It involves the co-ordination of distribution chain activities in order to create circumstances in which the underlying cost structure is lower than the sum of the service costs of each individual activity.

Intermodalism is a service innovation which redraws market boundaries of shipping lines, ports and land transport enterprises, thereby permitting exporters to penetrate markets traditionally served by other suppliers and providing importers with additional sources of goods. No distribution chain activity can be treated in isolation, as each has a number of interfaces with others that can increase or reduce system efficiencies. For example, a port can spend endless sums of money on facilities, market them to bring customers to its berths, cut rates, yet still find that carriers will go elsewhere because Customs are more co-operative. Without the "systems optimization" provided by intermodalism, the whole can be very much less than the sum of its parts. The change from "modal optimization" to "systems optimization" provides a total, rather than fragmentary, view of all activities in the distribution chain. The continuous movement of goods requires that all activities be integrated so that new levels of efficiency may be achieved when each element functions as part of a larger system.

The "systems optimization" of intermodalism may also bring about a need to rethink various aspects of transport planning. It will be recalled that one of the goals of transport planners is to define the "modal split" or the role played by each mode of transport. The "modal split" in transport planning permits each mode to be dedicated to those operations for which it has inherent advantages, in order to ensure efficient operation of the mode in question. In contrast, intermodalism marks a change from "modal split" to "modal integration" or from the efficient operation of each mode to that of "systems optimization". This is not to say that the efficient operation of each mode is not important, but rather that it becomes secondary to overall system efficiency. In fact, with "modal integration", the inefficiency or lower productivity of one mode may be quite acceptable if it results in proportionately greater gains for the entire system. For example, in the operation of an on-dock intermodal container transfer facility, which permits the movement of containers between vessels and waiting railway wagons, it may be found that a temporary storage area between vessels and wagons, involving double handling of containers, is required to avoid excessive investment in facilities and container handling equipment or drayage costs to other rail terminals.

The change from "modal optimization" to "system optimization" is something like the change from beam to arch construction. Beam and column construction resulted in buildings which were labyrinths of small enclosed spaces. However, when the same beam was divided into parts and put together in the form of an arch a new and more powerful combination resulted which permitted greater distances between supporting columns. A systems approach to the individual activities in the distribution chain eliminates the compartmentalization of such activities and joins them in new and more powerful combinations to achieve increased levels of efficiency. With "system optimization" the challenge is no longer to design and construct vessels, railroads or trucks, but rather to design and construct distribution systems which include those as well as many other elements.

Multimodal transport, in contrast, is an institutional concept which involves the issue of one bill of lading by a multimodal transport operator

(MTO) who assumes responsibility as a principal, not as an agent, for the entire transport operation from origin to destination. This does not mean that a MTO cannot seek to eliminate breaks in carriage operations and integrate distribution chain functions, but when such efforts are made the MTO is combining intermodal functions with the multimodal institutional concept.

Due to the growing interdependence of all the activities in the distribution chain, which historically have been treated as unrelated, there is a pressing need to create and strengthen structural ties between all modes and functions in order to take advantage of the benefits of "system optimization". Such structural ties, which are both institutional and physical, seek to ensure the continuous movement of goods and transport equipment from origin to destination. Probably the most common physical ties are containers and the use of computers and communications technology to bring the diverse elements of a distribution chain together in order that they may function as a system. On the other hand, some of the more important institutional ties include the reduction, simplification and harmonization of trade procedures and requirements of national Customs authorities, banks and insurance companies, and an international regime which defines the rights and obligations of all participants in the distribution chain when transport equipment is interchanged between them.

The establishment of intermodal systems does not seem to represent a logical extension of the ocean-liner industry, as many European and US lines have indicated that they do not wish to engage in inland transport operations, but rather a radical shift of direction from, and often a negation of, earlier operating procedures. American President Lines (APL) offer Asian and US shippers an intermodal system which utilizes the US landbridge and articulated railway wagons that permit the carriage of containers stacked two-high. This arrangement allows containers to be delivered to US East Coast destinations 86 hours after being discharged from vessels on the West Coast, which is six to 2412 days faster and less costly than the all-water route. Rail-ship intermodal operations require a great deal of schedule co-ordination. For shipping lines which operate on a weekly schedule, even a minimal delay in the return of a train to the US West Coast could make a second set of double-stack container wagons necessary. APL has estimated that its intermodal-landbridge arrangements have resulted in land transport savings of approximately 40 per cent and system savings of about 25 per cent.

When speaking of the US landbridge it is important to have a clear picture of the routes utilized for eastbound, westbound and northbound cargo movements. With reference to eastbound cargo flows, there are three major routes: (1) northern (US Pacific Northwest ports to Chicago, Illinois, and US North Atlantic ports), (2) mixed (US Pacific Southwest ports to Chicago and US North Atlantic ports), and (3) southern (US Pacific Southwest ports to US Gulf and US South Atlantic ports). There are westbound routes from US Atlantic ports to US and Canadian interior destinations such as Chicago, Houston, Texas, New Orleans, Louisiana, and Montreal, Canada. Finally, the US Gulf ports of Houston and New Orleans currently offer traditional container on railway flatcar (COFC) services to many northern destinations.

Presently there are 62 double-stack container trains, each carrying 400-560 TEUs, that depart US Pacific ports on a weekly basis. The quantity

of containers filled with imports which move eastbound from those ports has been estimated at 29 000 TEUs per week on double-stack container trains, which is approximately 25 per cent of all US intermodal movements. Union Pacific (UP) Railroad estimates that the dynamic growth in utilization of double-stack railway transport will continue and should double between 1987-1989. With reference to rates, railroads presently charge approximately US\$ 1 000 for the movement of an ISO 40' unit from Los Angeles, California, on the US west coast to Houston, Texas, on the US Gulf coast, while shipping lines using the all-water route would charge around US\$ 1 400 to US\$ 1 500. The rail movement should take less than two days, while approximately seven days would be required for the all-water route via the Panama Canal. The ocean-liner companies which take advantage of US landbridge arrangements include domestic lines of that country as well as those from Asia and many cross traders. For example, Mitsui O.S.K. Lines and Southern Pacific Transportation Company (railroad) began a double-stack container service from Los Angeles, California, to Chicago during January 1986 and claim that the overall transit time from Tokyo, Japan, to Chicago is just 12 days.

Even though the US landbridge has proved extremely popular for liner operators worldwide, it has been estimated that double-stack container systems may capture only 40 per cent of the COFC and road trailer on flatcar (TOFC) market. A different view is taken by the UP's vicepresident-intermodal, Donald A. Shum, who considers that TOFC operations will be replaced by containers over the next five to seven years. Due to the tremendous quantity of containers filled with imported goods moving eastbound each week from US Pacific ports to inland destinations, there is a pressing need to locate cargoes -both domestic and export- for the return trip. A essential factor in the profitability of double-stack container operations is locating cargoes at inland destinations for remunerative backhauls. This need has led many shipping lines to engage in domestic cargo generation activities. For example, to ensure the availability of backhaul cargoes, in 1985 APL purchased three domestic freight brokers from the Brae Corporation for US\$ 60 million (National Piggyback Services Inc., National Piggyback Specialized Commodities Inc., and Intermodal Brokerage Services Inc.), established AP Intermodal and AP Domestic, and engages in an extensive marketing programme.

Other landbridges on the American Continent include those of Canada, Mexico, Panama and various South American alternatives. The Government of Canada has undertaken the construction of new routes between Calgary, Alberta, and Vancouver, British Columbia, on the west coast. This undertaking involves lowering track gradients from 2.44 to 1.0 per cent, which will reduce the number of locomotives required, constructing double track on parts of the route, reducing track curvatures, and constructing two tunnels at Rogers Pass in the Canadian Rockies (one of 1.9 kms and another of 14.7 km), in order to facilitate the movement of grain and coal as well as the use of double-stack container wagons. The entire project is scheduled to be finished during November 1988. Nonetheless, with existing tracks and equipment Alberta Intermodal Services, a company established by the Government of the Canadian province of Alberta to co-ordinate cargo movements from Calgary and Edmonton to Pacific Northwest ports, indicated that it moved 6 000 TEUs during the first five months of 1986. This volume of containers exceeded forecasts by 10 per cent.

The Mexican landbridge is located at the Gulf of Tehuantepec, between the ports of Salina Cruz and Coatzacoalcos, and was inaugurated during April 1982. The terminal ports of the Mexican landbridge do not have a substantial hinterland, as is the case with those of Canada and the US, and it offers its services as a true "bridge" between two ocean movements. Panama has sought to build upon the large amount of shipping which utilizes its Canal by offering landbridges across the Isthmus for various types of cargoes. These landbridges form part of what the Government of Panama calls its centre-port concept or centerport. This concept involves the integration of 10 Atlantic and Pacific ports with land, railway and pipeline transport systems, and the use of Panama's character as an entrepot for the movement of goods between oceans, as well as their storage and transformation. Finally, efforts have been made to use numerous routes between the east and west coasts of South America. Most recently, Argentine soyabean was transported by railroad from that country to Antofagasta, Chile, and at this latter port loaded aboard ship for carriage to Mexico. The Andes have always been a physical barrier to commercial exchanges, and this movement was no exception. Upon reaching the foothills the 30 car trains had to be broken down into units of 10 and hauled by multiple locomotives over the mountains.

The other major landbridge is the trans-Siberian (TSL), which presently carries 20 per cent of Japan and South Korean trade by railroad to Europe on block trains of 104 TEUs with a 30 day transit time. Due to the different railway gauges used by the TSL and those of Western Europe, containers are normally transferred between railway wagons at Terespol, Poland, or between the TSL and vessels of the Baltic Shipping Company or United Baltic Corporation at Leningrad, Russia, for on-carriage. With the exception of 1986, when there was a 20 per cent decrease, the number of containers transported on the TSL has been increasing since 1970 and has reached approximately 100 000 TEUs annually. The decline in 1986 was attributed to the low freight rates being offered by non-conference carriers operating on the Europe/Far East route and is considered temporary by Intercontainer, the European railways joint venture which transports much of the TSL traffic in Western Europe. With the recent completion of a second trans-Siberian line, known as the Baikal-Amur Magistral, transit times should be reduced 25 per cent, since the average speed of trains will increase from 45 to 60 kms per hour, and capacity will be raised to about four times that of the original line. It has been estimated that 600 000 containers will be carried on the TSL by the year 2000.

During September 1982 Soyuztransit, the agency which operates the TSL, decided to demonstrate its potential and made the 11 000 km trip from the Far East port of Vostochny to Brest, Poland, in 12 days. This transit time should be compared with the ACE Group consortium (composed of Cho Yang Shipping, Franco-Belgian Services, K Line, Korea Shipping Corporation, Neptune Orient Lines and Orient Overseas Container Line) which requires 29 days for the all-water route between Europe and the Far East, which is approximately 22 000 kms long (twice the land transport distance). With reference to rates, the TSL costs 10 to 20 per cent, and in some cases 30 to 40 per cent, less than conference carriers. As a partial response, conference members grant reductions of between 10 and 30 per cent to shippers of certain commodities who provide a regular volume of traffic.

Numerous carriers and cargo owners make use of the TSL. For example, the Japanese shipping company Yamashita-Shinnihon Line provides services

between Asia and Europe only by the TSL. Finanglia Ferries, a joint venture of Finn carriers and the United Baltic Corporation of the United Kingdom, seeks to use the Finnish-Russian compatible rail gauge as well as connections to provide cargoes for its vessels which trade between Kotka, Finland, the UK and continental Europe. Intercontainer, the European railways joint venture, provides a rapid twice-weekly block train which serves the TSL from Vienna, Austria, by way of Zahony, Hungary. The Japanese automobile manufacturer Nissan has recently begun to utilize both the TSL and specialized car carriers, but for a period of 10 years it made exclusive use of the TSL to move automobile spare parts from Japan to various Western European countries. During this time Nissan found that the rates and transit times were either less than or comparable with those of conference carriers. The reason for Nissan's change is related to European import limitations for assembled automobiles and the resulting need to fill its chartered vessels.

One can only speculate on the impact the TSL could have on liner shipping in the Asia-Europe trade if, for instance, transit times were brought down to a consistent 20 days and double-stack container wagons were utilized. A transit time of 20 days is possible, as the 25 per cent increase in train speed should result in a reduction of transit times to 22.5 days. The considerations regarding the use of double-stack container wagons on the TSL would probably be the same as those for almost any other landbridge: that is, the distances containers would be carried, the volume of demand, availability of backhaul cargoes and the cost of removing physical obstacles. It should be kept in mind that where technological innovations result in cost savings and/or increases in efficiency, they have a way of imposing themselves on existing systems. Thus, one might ask if TSL productivity increases would be sufficient to make 20 per cent of existing liner vessels in the Asia-Europe trades redundant? If so, in which alternative trades would those vessels seek employment?

The impact of intermodalism on the demand for ocean-liner services will be enormous, but the potential influence of such arrangements on vessel designs, trade routes and trading economics could be even greater. Indeed, such potential might be compared with the changes brought about by the opening of the Panama (1914) and Suez (1869) Canals. It will be remembered that these canals changed locational linkages between production and consumption, brought together geographically distant markets, modified the cost structure of transport, influenced the maximum dimensions of vessels and greatly reduced the volume of shipping services utilizing trade routes via Cape Horn and the Cape of Good Hope. While landbridges will not divert all liner traffic, as did the canals, it would appear that they could take a large part of such traffic. Probably the most important lesson to be learned from intermodalism is that even though there exists a demand for ocean-liner services, in a growing number of trades it no longer belongs totally to that industry. Thus, in the light of a possible decrease in demand for liner services, one might ask if the liner industry is on the threshold of a world fleet reduction similar to that which occurred when cellular ships displaced their general cargo counterpart?

#### D. Large-scale vessels

Economies of scale refer to a reduction of average production costs as the size of a plant increases. Applied to liner shipping this would mean increasing vessel sizes to lower average transport costs per container. Full exploitation of economies of scale in the ocean-liner industry is limited by the size of the demand for transport services. For an individual liner operator this means that the overall demand in the trade routes served must be measured against factors such as competition, frequency requirements of shippers and consignees, balance and seasonality of cargo flows, etc. In this context, economies of scale in ocean-liner shipping can exist at almost any vessel capacity range. For example, short-sea transport operators might have economies of scale at a maximum of 250 TEUs, whereas for deep-sea operators in north/south trades the figure could be 1 500 TEUs, and for those in east/west trades it might reach 3 000 TEUs. In liner shipping, scale-economy vessels are those which lower the average transport cost per container and, at the same time, reflect trade characteristics in areas such as types and volumes of cargoes in movement, degree of imbalance, frequency requirements of shippers and consignees, actual and projected competition, etc.

For over 100 years any attempt by liner vessel operators to reflect the characteristics of trade demand and reach new scale economy levels was restricted by the slow loading and discharge rates of general cargo vessels. Containerization did not eliminate this restriction, but it raised the rates enough to permit the size of ocean-liner vessels to be increased considerably. For example, a general cargo vessel of approximately 10 000 DWT requires five days and nights to load and a similar period to discharge the same cargoes. In contrast, cellular container vessels of twice that size generally require only one-fifth of that time, i.e., one day. As slow loading and discharge rates limited the maximum size of general-cargo vessels, if more cargoes were to be moved on a particular trade route additional vessels had to be placed in service. Containerization reversed this "more-with-more" requirement by permitting increases in productivity with fewer vessels. The "more-with-less" trend of containerization can be seen, for instance, from a recent declaration of Overseas Containers Limited that it would need 140 general-cargo vessels to transport the cargo now carried by its present fleet of 20 container ships.

In an effort to take advantage of the relatively fixed nature of the operating cost for vessels through a wide range of cargo carrying capacities, during the early years of containerization many ships were lengthened or jumboized to increase their cargo carrying and, hence, earning capacity. With the growth in the use of containers in most trades, liner operators began to increase the sizes of their new vessel orders -reaching a current maximum capacity of 4 458 TEUs. Very large liner vessels reduce transport cost per container per mile and earn profits or lose less when smaller vessels would do worse. For example, the cost per container per mile for a vessel of 2 700 TEUs is approximately 50 per cent less than that for a vessel of 1 500 TEUs.

Notwithstanding the cost advantages of larger liner vessels, however, in a market with declining trade volumes the matching of those vessels' cargo needs to achieve an adequate return-on-investment with the frequency requirements of shippers and consignees may become impossible. For example, the Lorenzo Shipping Corporation (LSC) operates a fleet of 10 vessels with

capacities ranging from 48 to 60 TEUs in the Philippine inter-island trades. With the decline in inter-island trade volumes LSC competitors operating 500 TEU vessels have gone bankrupt, as they had to wait for additional cargoes to fill their vessels for remunerative voyages and could not maintain the frequency required by shippers and consignees. LSC not only maintains the desired frequency but also a reasonably profitable operation.

Many liner operators such as ABC Container Line, Barber Blue Sea, EL, US Lines (USL) and others offer round-the-world (RTW) services. Nonetheless, with the arrival of the RTW services of EL and USL, many European and US ship operators as well as those of this region believe that they face the very real risk of forced rationalizations or merely providing feeder services for those operators. Until its recent bankruptcy USL utilized 12 very large liner vessels of 4 458 TEUs in its eastbound service, while EL employs 20 vessels of 2 728 TEUs and two of 2 940 TEUs in its east and westbound services. Both of these lines offer traditional end-to-end, ocean-feeder and inland transport services.

In general terms, when selecting a vessel for an ocean-liner service the following three areas are normally considered: (1) costs (operating, investment, charter, etc.); (2) physical limits (ports, canals, etc.); and (3) trade requirements (volumes and types of goods, degree of imbalance, seasonality, frequency needs of shippers and consignees, competition, etc.). To achieve the desired economies of scale USL, for instance, focused heavily on the first two areas and constructed its 12 large-scale 4 458 TEU vessels, with only 146 spaces for refrigerated containers, which have a length of 949.8' (289.5m) and a beam of 105.7' (32.218m). These vessel dimensions were selected to obtain a very low container transport cost per mile (US\$ 0.034 at 100 per cent utilization), while ensuring that such vessels might transit the Panama Canal in the company's RTW service (the maximum vessel dimensions for Panama Canal transit are 950' X 106' or 289.56m X 32.31m). Based upon a crude petroleum price of US\$ 30 and an estimated price of US\$ 50 by 1990, these vessels were designed for a maximum speed of 18.5 knots, which is 25 per cent slower than the vessels of its major competitor EL. With the reduction in the price of crude petroleum to US\$ 10-18, this speed has become uncompetitive.

The construction of these large, energy-efficient container ships by USL can best be understood by recalling that the current owner of USL, Malcolm McLean, was the owner of SLS until it was sold to R.J. Reynolds Industries in 1969 for US\$ 160 million. While owner and later member of the board of directors of SLS, but prior to the era of expensive oil, he constructed large (at that time), energy-inefficient vessels -- the famous 33 knot "energy-hungry" SL-7 container ships. As these foreign-built vessels became uneconomic to operate after the October-December 1973 oil crisis, they were operated at reduced speeds and finally sold to the US Government, converted and placed in its national defence fleet.

Whether USL correctly matched the characteristics of its 12 large-scale vessels with trade requirements was partially answered during the first quarter of 1985 when McLean Industries lost US\$ 7.48 million with only six of those vessels in service. This compares with a net profit of US\$ 11.38 million during the first three months of 1984. The first quarter losses of 1985 were attributed to excess liner transport capacity, low rates and reduced cargo volumes. On the other hand, APL and SLS in the same period (first quarter of 1984 and 1985) experienced reductions in earnings of 35.2

per cent (US\$ 14.2 to US\$ 9.2 million) and 38.1 per cent (US\$ 13.4 to US\$ 5.1 million), respectively, but no losses. By September 1985 USL inaugurated its RTW service with all 12 large-scale vessels and for the entire year lost US\$ 66.7 million. Due to low rates, reduced cargo volumes and excessive competition USL was unable to generate sufficient cash flow for the annual payment of US\$ 200 million on its debt of US\$ 1 billion. These payments were required not only to service the debt but also to reduce USL's debt-to-equity ratio from 4:1 to 2:1 by 1987. During the first three quarters of 1986 USL lost US\$ 70.8 million, US\$ 76.8 million and US\$ 89.3 million (a total of US\$ 236.9 million), and it is expected to have lost approximately US\$ 80-90 million in the final quarter of 1986.

In view of these losses, USL renegotiated its loan agreements, prepaid three years of first mortgage loans on its 12 large-scale vessels and deferred other debt payments over the next two years. Efforts were also made to sell the 12 large-scale vessels to Scandinavian interests for US\$ 50 million, but that amount was judged insufficient by the secured creditors and discussions were terminated. On the operational side, USL dropped the ports of Marseilles-Fos, France, and Jeddah, Saudi Arabia, from its weekly eastbound RTW service, placed five vessels in lay-up (inactive status) and eliminated its protected cabotage service between the US West and East Coasts.

On 24 November 1986 USL and McLean Industries, its parent company, declared themselves bankrupt, applied for protection from creditors and restructuring under Chapter 11 of the US bankruptcy laws and ceased RTW operations with its 12 large-scale vessels, which are currently laid up in the US or under arrest elsewhere. USL continues to operate its trans-Pacific and South American services, but has entered into agreements for the sale of the former, which includes six vessels and terminal facilities, to SLS for US\$ 125 million, and for the transfer of the latter to American Transport Line, a Crowley Maritime company, on a fixed-payment lease for the four vessels, together with the purchase of USL's subsidiaries in Argentina and Brazil. Both agreements are conditional on the approval of USL's creditors and the bankruptcy court. The filing for bankruptcy brought about a change of members on the board of directors, with Malcolm McLean being replaced by Charles Hiltzheimer. It will be recalled that Mr. Hiltzheimer was chief executive officer of SLS and has extensive industry experience. One can only speculate as to what additional measures will be adopted under the Chapter 11 procedure, but the extent to which the US Government views USL vessels as part of its overall maritime policy must be considered, since this could determine the availability of subsidies, a sale and leaseback arrangement or another purchase for its national defence fleet.

### E. Load centering

As the simplicity and economy of containerization can be lost through port-to-port movements, numerous factors such as large-scale vessels, increasing cost-effectiveness of land transport services, efficient ports and simplified Customs and other trade requirements have greatly expanded the traditional hinterland of ports. For example, the port of Houston, on the US Gulf Coast, finds its major competitors to be the West Coast ports of Los Angeles and Oakland, California, and the East Coast ports of Jacksonville (Florida), Savannah (Georgia), and Norfolk (Virginia). The expansion of one port's hinterland means that it will begin to attract cargo which



historically flowed through another port. The increase in demand for the services of certain ports will result in their becoming transshipment, load or hub centres for other ports.

Ship operators take many factors into account when determining whether a specific port will be served directly or by a feeder arrangement, but probably the most important one is related to the volume, balance and stability of cargo flows. Other factors ship operators consider are the distance of a port from the normal vessel route, port facilities, costs and efficiency, vessel turnaround time, inland transport connections, and proximity to alternative ports with greater cargo volumes. It is interesting to note that during the late 1960s Singapore was foreseen as the transshipment centre for all Australia. As the cargo volumes to Australia were sufficient to commercially justify direct vessel calls, however, this did not come to pass. Moreover, certain ports of Australia have resisted the trend towards load-centering. The south coast port of Adelaide, for instance, made various efforts over a period of 10 years to obtain the cargo volumes needed and now receives limited direct vessel calls. Under present conference arrangements approximately 50 per cent of containers originating at or destined to Adelaide are carried by vessels which call at Melbourne on the southeast coast and are transported between those ports by the State Transport Authority --Victoria or V-Line Railway-- in six eastbound and five westbound block trains per week.

The above-described trend towards load-centre ports is real, but its impact on east/west and north/south liner trades could be quite distinct. East/west trades, which are usually between developed countries, present carriers with a reasonably balanced, large flow of high-value cargoes. In contrast, north/south trades between developed and developing nations are generally unbalanced, with a wide range of cargoes which often provide only minimal compensation. Likewise, origin and destination countries in east/west trades have extensive inland transport infrastructures and legal regimes which permit the rapid flow of goods between interior points and ports, whereas in north/south trades such infrastructures and legal regimes have only recently begun to be placed in operation. Further, distances between the principal Latin American ports are greater than in the cases of Asia, Europe and North America. Due to north/south trade characteristics, the lack of inland transport infrastructures and institutions and greater distances between ports, vessel operators should continue to make direct calls at Latin American ports for the foreseeable future.

#### F. Overtonnaging

This section briefly evaluates the excess offer of liner transport services, often referred to as overtonnaging. Nonetheless, it is necessary to recognize at the outset that overcapacity is a problem common to almost all subsectors of the marine industry. Whether one looks at tug-boat operators, stevedores, liner companies, shipyards, diesel engine manufacturers, pilots, financing for ship construction, container leasing, consultants or whatever part of the industry, they are all plagued with overcapacity. It is generally recognized that this universal problem can no longer be considered as a cyclical phenomenon from which the industry will return to earlier trading conditions, but rather as a chronic state which has led to bankruptcies, rationalizations and a general redimensioning of almost all marine activities.

Between 1970 and 1984 world seaborne trade grew by 32 per cent, while the size of the world merchant fleet increased by more than 100 per cent. By types of vessel, the world-wide surplus is approximately 36 per cent for tankers, 22 per cent for dry-bulk carriers and 33 per cent for container ships. Freight rates for many types of ocean-liner cargoes are less than a third of what they were five years ago. The fall in freight rates probably understates the extent of the overall reduction -- five years ago rates were generally quoted for port-to-port carriage, while today these same rates often include inland movements. With the spin-off or separation of containers from liner shipping and their transport under contractual arrangements, as described in parts II.A. and II.B., container ship capacity and demand might be more closely matched, possibly resulting in the concentration of container transport in the hands of a few operators and a low level of employment for the remainder in unbalanced, reduced or seasonal trades. In the current overtonnaged market it is unlikely that rates will give liner operators an acceptable return-on-investment until a balance is restored between the demand and supply of shipping services, and many commentators do not expect this to happen before the mid-1990s.

Overtonnaging is caused not only by an excess of vessels but also by their increasing productivity. Modern gantry cranes which permit faster loading and discharge times, Customs procedures which facilitate the rapid dispatch of goods from port areas or interior cargo terminals, and landbridges which eliminate long voyages can all increase vessel productivity. For example, the landbridge between the US West and East Coasts permits APL to eliminate the 16 day sailing and port time for a round voyage between those coasts via the Panama Canal. The vessel time saved is utilized for another voyage between California and Japan, as well as for two port calls in the latter country.

With decreasing cargo volumes in numerous trades, an excess of transport capacity and reduced freight rates, a major question comes to mind: Why are there so many new vessels? While each person would have a response based on his view of the industry, it would seem that the answer is focused in three related areas: (1) large new vessels with technical advances which significantly lower operating costs, (2) an excess of shipbuilding capacity which is supported by governments and banks, and (3) an oversupply of funds from governments and banks to lines and shipbuilders. A vicious circle has resulted in which lines must buy technologically advanced, larger vessels to remain competitive, but as they lack funds they seek assistance from their banks and governments. The banks and governments, which become or already are owners of the lines, must provide the funds or accept bankruptcy of their lines. In order to utilize the funds nationally and to avoid unemployment at domestic shipyards, governments and banks usually finance the construction of new vessels at local shipyards.

Many governments seek to assist their shipbuilding industries through subsidies in order to close the gap between domestic newbuilding prices and those of lower-cost countries. The use of subsidies in this manner has become so universal that many countries and economic groups have issued guidelines which establish the maximum amounts allowable. The EEC, for instance, presently sets the maximum subsidy allowable for new vessels at 28 per cent of the contract price. Notwithstanding these guidelines, one European national shipbuilders' association recently requested an increase in shipbuilding subsidies from its government and indicated that subsidies of as

much as 40 per cent were being granted to the troubled shipbuilding industry in other EEC countries.

The need of shipbuilders to keep their facilities and workers employed has led to practices such as excluding items from newbuilding prices, with governments assisting by granting soft-term loans or export-credit subsidies and including part or all of such prices in foreign-aid programmes. The combination of these practices and the maximum allowable or guideline subsidies for new vessels can result in substantial concessions being granted to vessel owners. For example, according to Karl-Heinz Sager, the Chairman of Senator Line, APL received a total subsidy of 70 per cent of the newbuilding price for its five 3 800 TEU container ships in order that they might be constructed in West German shipyards. All shipbuilding subsidies, in effect, discount the price of and reduce owners' equity requirements for new vessels, and create an incentive for other operators to acquire vessels under similar conditions so that they can compete. After acquiring new vessels, the older vessels are often not sold for scrap but rather to other shipping companies at reduced prices, thereby adding to the oversupply of transport capacity.

The First International Capital Group has made an effort to determine the magnitude of ship finance losses which might result from this situation, and is of the opinion that they could reach a total of at least US\$ 20 billion, while for the period 1984-1986 the Marine Midland Bank estimated losses of US\$ 2 billion. The Bank of America's shipping loan losses in 1985 accounted for nearly two-thirds of its overall deficit of US\$ 337 million. To cope with excessive loss exposure, two major West German ship finance banks, Schiffsbekleidungs-Bank AG and Deutsche Schiffahrtsbank, paid no dividends to stockholders in 1985. The first-named of these two banks did not pay any dividends in 1986 either. A measure of the risks inherent in ship finance can be seen from the reduction in the number of banks in the field. The Bankers Trust Company estimates that during the period 1979-1981 there were between 200 and 250 banks involved in ship financing. That number dropped to below 50 in 1985 and in 1986 it was reduced to 12-15. The size of such losses and the limited number of banks which offer ship finance illustrate the high risks involved and indicate that many lending institutions overextended themselves in earlier, more expansionist years.

Overtonnaging results in rationalizations and bankruptcies in the short and medium term, but the greatest danger of this problem stems from its long-term impact on the critical mass of skills, institutions and equipment which support the industry. On the one hand shipping appears to be an industry in decline, with a continuous reduction in the number of vessels and employment opportunities, while on the other it has all the characteristics of a dynamic "high-tech" industry with technical and service innovations and legal regimes which permit new operating patterns and cross-modal mergers. Even though the critical mass is being redimensioned to conform to new realities, the attractiveness of liner shipping for a career has been denigrated due to a mistaken belief that it is a dying industry. The structural changes now occurring in ocean-liner transport must not be recklessly confused with death of the industry. That there will be fewer people in the industry after restructuring is a foregone conclusion, but what must be clearly understood is that the knowledge and experience of those who remain will be decisive in determining its future directions. The questions then become: How can the "best and brightest" be attracted to the industry, and how can appropriate persons in the industry be identified for further

training in economics, law and management so that they can become the industry's leaders of tomorrow?

Ocean-liner transport provides a central focus for almost all aspects of international trade. For example, international trading companies have indicated that without an operating presence in the industry it would be very difficult to negotiate a favorable charter arrangement, understand what are acceptable losses from transport, or even present an appropriate request for cargo insurance. It has been suggested by shipping interests of the United Kingdom that efforts should be undertaken to determine the minimum fleet size for that country and the needed levels of Government support. For both developed and developing countries ocean-liner transport provides an important learning environment that goes far beyond the mere movement of goods. Due to the enormous number of governments, shipping lines, shipbuilders, banks and other institutions involved, and the ongoing evolution of the industry, there is no one solution to the overtonnaging problem but rather a co-ordinated global, flexible, dynamic and continuous response to an ever-changing situation.

#### G. Ocean-liner and commercial concentration

The growing concentration of ocean-liner transport can be seen from the arrival on the world scene of large-scale vessels, joint-service arrangements, load-centre ports and the seemingly ever-increasing reach of inland transport systems. The major goal of such concentration is not the creation of monopolies, but rather economic survival through service rationalizations and economies of scale. It has been estimated that by the end of the century there will be only two liner carriers in Japan, one in Korea and three in the USA. This will be accomplished through a decrease in the number of individual lines and vessels, but without a reduction in either service frequency or capacity.

Shipping lines have begun to change from being owners and operators of vessels to just operators, while banks, governments, shipyards and leasing companies are assuming the role of owners. In response to this change, the functions of ship managers have greatly expanded from the traditional repair and manning activities to others which range from consulting and design services to insurance and from construction and conversions to completely organizing the employment of vessels. Numerous operators consider that an owner-operated vessel reduces operational flexibility, as a line is usually bound to utilize its own ship even when trade requirements or technological advances may have rendered it unsuitable. In contrast, charterers can change the characteristics of the vessels they employ at the termination of their charter parties, thus providing them with frequent opportunities to match vessel characteristics with trade requirements. If the present trends toward fewer-but-larger liner companies and a separation of vessel operation and ownership continue, liner shipping of the future will be dominated by large conglomerates, huge management concerns and financial institutions which jointly control transport services either directly or through brokers.

In a similar manner, commercial exchanges are being concentrated in the hands of an ever-decreasing number of persons. This can be seen from the declarations by carriers that 80 per cent of their cargoes come from less than 50 shippers. Certain large freight forwarders and trading conglomerates represent an enormous concentration of negotiating power which allows them to

dictate the freight and service levels of liner operators. Moreover, the growing use of service contracts and shippers' associations contributes not only to the concentration of commercial activities but also to the strong negotiating power of cargo owners. Service contracts and shippers' associations permit the grouping of small quantities of cargo and the joint negotiation of freight rates. These negotiations are usually carried out by representatives of cargo owners, which again reduces the number of persons involved in commercial exchanges. In certain regions a close relation between cargo owners and carriers has always existed. For example, the major liner operators of Japan regard themselves as bound by custom to provide services to those destinations indicated by Japanese trading companies.

The increasing concentration within the ocean-liner industry and the trade interests it serves should be evaluated in the light of a possible spin-off or separation of containers from other liner cargoes and their carriage under contractual or charter arrangements. If such a separation does occur, ocean-liner companies on high-volume routes will probably become part of or have close contractual arrangements with the production and consumption functions. These arrangements should permit greater efficiency in distribution chain activities, but one might ask if this could lead to large multinational companies and transnational corporations as well as cartels controlling the marketing of goods. Not all of the homogeneous cargoes which have been spun-off from ocean-liner transport have fallen totally under such control. Nonetheless, joint ventures between Korean and US automobile manufacturers regarding the production, transport and marketing of Korean automobiles in the US, the purchase, transport and sale of bananas by Dole, Geest Industries and United Brands, and the control of oil prices by the Organization of Petroleum Exporting Countries are all examples of the need to study the relation between the growing concentration of transport on the one hand and the marketing of goods on the other.

### III. TECHNOLOGIES

The history of containerization during the last three decades has shown that changes in ocean-liner technologies require a fairly long period for commercial, financial, legal and social acceptance. This period has also shown that technological advances in ocean-liner transport rarely follow a straight path, but often proceed as part of a dynamic, lurching process. One might ask, what was the process that led to containerization, and will it be repeated in the development of new ocean-liner technologies?

From the point of view of transport, modern commercial transactions involve a physical and institutional split between producers and carriers. Production and transport are considered individual activities which are carried out by specialists in each field. In recognition of the cost and time savings possible from a partial closure of the physical split, Malcolm McLean of McLean Trucking took a revolutionary step by developing a cargo unit which could be carried indiscriminately by liner vessels, trucks and railroads. This closure involved the carriage of the same sacks, crates and barrels in which goods had traditionally been transported, but rather than being handled individually, they were placed in large reusable metal boxes which would come to be known as containers. The shipping line Mr. McLean established demonstrates this partial closure with its name "Sea-Land" Services. Other ocean-liner carriers such as APL have taken this original

initiative and further closed the physical as well as institutional splits between production and transport by developing double-stack container wagons and creating an intermodal system embracing all the links in its distribution chain - ports, vessels, Customs and inland transport services - between Asia and the US.

The ocean-liner technologies which will be developed in the future must come about from a further closing of both the physical and institutional splits between production and transport. The final closing of these splits may ultimately see ocean-liner companies becoming part of shippers' marketing functions and/or of the consignees' inventory activities through contract carriage arrangements, as was discussed in part II.A. It should be highlighted that in this situation international competitiveness may arise not so much from the comparative advantage of being a traditional seafaring nation but from the ability to integrate ocean-liner services into the production and consumption functions.

The first step in this process should start with a change in the commercial dialogues which are carried out independently and range from those between financial institutions, shipbuilders and ship operators, to those between ship operators, cargo owners and ports, and finally those between cargo owners, ports and inland transport modes. In the future such dialogues will probably commence at the design, financing and ownership stages of new transport technologies and continue with vessel operations, modifications and even scrapping. For example, ship operators, shipbuilders, banks, cargo owners, ports and inland transport modes will establish a long-term relation based on the needs of a specific trade in order to reduce the lengthy process for acceptance of new vessel designs and, at the same time, create more cost-effective, specialized transport technologies. These technologies will reflect or will be modified to reflect the market, technological, service and legal forces which are continuously restructuring the ocean-liner industry. These changes in the traditional commercial dialogue process will bring about new technologies or new applications of existing ones in the following areas (a) vessels, (b) containers, (c) ports and inland transport and (d) computers and communications.

#### A. Vessel technologies

While most industry specialists agree that major advances have been made in hull design and propulsion efficiency, few have evaluated the passive character or terminal inefficiency of cellular vessels during loading and discharge operations. As an example, the preparation of a general cargo vessel for loading and discharge operations utilizes most of the crew and begins at sea with the rigging of booms and the partial opening of hatches. In contrast, cellular vessels rely entirely on port labour to prepare the vessel for container handling operations as well as to carry them out. To reduce such passivity, some consideration might be given to vessel modifications which assist loading and discharge operations. For example, a "keystone" container space might be created for each row, with movement of containers inside the vessel to and from such spaces. These spaces would not only receive from and deliver containers to the gantry crane, thereby reducing the enormous amount of crane travel time, but also eliminate the need for ever greater crane outreach to handle the last 3-5 rows of containers on vessels which have beams wider than the Panama Canal maximum of 106' (32.31m). Barge carrying LASH (Lighter Aboard SHip) vessels utilize the

"keystone" space concept, with all lighters being loaded and discharged by one crane at the stern of the vessel.

Another vessel technology change which can be foreseen would be a closer relation between, for instance, sources of financing, shipbuilders, ship operators, shippers, consignees and ports. Historically, general cargo vessels and even certain cellular vessels with their own cranes could be shifted between different trades as the demand for transport services changed. Indeed, general cargo vessels were often referred to as GALA or "go anyplace, load anything". If current trends continue, however, in the future liner vessels will become extremely inflexible: that is, they will be designed through collaboration of the above mentioned parties for specific uses (cargoes) and trades (routes and ports). For example, collaboration between participants in the EUROSAL consortium (GMB, Compañía Sudamericana de Vapores, Hapag-Lloyd, Johnson Line, Líneas Navieras Bolivianas, Compañía Naviera Marasia, Nedlloyd, Pacific Steam Navigation Company and Transportes Navieros Ecuatorianos), shippers and port authorities resulted in a vessel design which is considered the most appropriate for the Europe-West Coast of South America trade.

The change of liner vessels from GALA to vessels for a specific use and trade may be compared with a change from buying clothing at the Salvation Army to a boutique. It should be understood that the change from "Salvation Army shipping" to "boutique shipping" is quite profound for both developed and developing countries. Developed countries have historically looked to their developing counterparts as potential purchasers of vessels which have been displaced technologically, but the latter countries can no longer be looked upon as potential buyers of vessels which were designed for other uses and trades. Even the Greek shipping fraternity's successful practice of purchasing second-hand vessels and making extensive modifications to them should be questioned in the light of the market, service, technological and legal forces which are restructuring the industry. To create an economically viable, competitive liner fleet, developing countries must employ vessels which are designed for the specific cargoes and trades they wish to serve.

It has often been stated that container ships are four to five times more productive than their general cargo counterparts. In practical terms this means that container vessels carry as much cargo and travel as many nautical miles in four to five years as did general cargo vessels in 20 years. Not only are container ships more productive than general cargo vessels, but overtonnaging, as discussed in part II.F., has given shipbuilders an incentive to make continuous and rapid advances in ocean-liner technology so that new vessels can be sold. Owners and operators should evaluate such advances to determine which of them might be incorporated into vessels to improve productivity -carry more cargo, decrease port-stay requirements, etc., and efficiency -reduce crew requirements, fuel consumption, etc. Just as the yearly financial statement determines the financial health of a carrier, a five-yearly technical and economic evaluation could easily determine levels of obsolescence and the costs/benefits of needed modifications versus scrapping. In order to avoid the risks involved in ownership of vessels which may become technologically obsolete, many ocean carriers will probably charter rather than own the ships they operate, and will maintain an on-going relation with financial institutions, shipbuilders and cargo owners to either modify or scrap chartered vessels when they are not the most cost-effective means to meet cargo and trade needs.

## B. Container technologies

Historically, the maximum dimensions for land transport in the USA have always had a major influence on marine container sizes. This is because of the pioneer status of US carriers in this field and the broad trade relations of that nation. For example, in 1956 SLS was the first shipping company to begin carrying containers and the dimensions selected were 35' X 8' X 8' (10.67m X 2.44m X 2.44m). This size was selected for two reasons: first, 35' was the maximum length permitted on roads of New York, New Jersey and Texas; and second, the 8' height was the maximum physically permissible on the then existing chassis for movements between New Jersey and New York via the Hudson Tunnel. Two years later Matson Navigation Company (MNC) began transporting containers with the same width and height but 24' (7.32m) long on the US West Coast, for similar reasons.

In 1977 the ISO published its Recommendation 688 concerning dimensions for freight containers. These international standard dimensions did not include either the 35' or the 24' lengths, but nonetheless the ISO considered that the range of sizes adopted (lengths of 10' (3.1m), 20' (6.1m), 30' (9.1m) and 40' (12.2m), with uniform 8' (2.44m) widths and heights) were sufficiently flexible to encompass the trades served by SLS and MNC. The impact of the ISO freight container dimensions on international container movements can be seen from the changes at SLS. For 20 years SLS utilized 35' containers, as its road transport services and container terminals are wholly owned and operated by it, but approximately 10 years ago it began the costly process of changing from 35' to 40' lengths. In contrast, MNC is able to continue with the 24' length, as its services are limited to a domestic closed-loop between the US west coast and Hawaii.

The US ocean-liner carriers are no longer the only pioneers in the industry, but the enormous trading potential of that nation and the growing use of intermodal systems in its trades, as discussed at part II.C., nevertheless make it desirable that international systems should be compatible with the inland transport systems of that country. It should be noted that the US Government adopted legislation entitled the Surface Transportation Assistance Act of 1982 (STAA) which increases the maximum dimensions for road transport on its 181 000 mile national interstate highway system to a trailer length of 48' (14.63m) or two trailers of 28' (8.53m) each and a width of 8'6" (2.59m). These new US dimensions were selected to increase the productivity of road transport vis-à-vis its rail competition. Canada had already adopted domestic container dimensions similar to those of the STAA in 1979 -- length of 44'3" (13.49m) height of 9'6" (2.9m) and width of 8'6" (2.59m) -- in order to permit the carriage of two units on an 89' (27.13m) railway wagon. While these non-ISO dimensions are intended for domestic cargo movements, their potential impact on international maritime transport must be carefully watched.

Approximately five years ago APL began experimenting with non-ISO size marine containers in its intermodal transport system between Asia, US West Coast ports, and interior as well as East Coast destinations. The dimensions tested were 45' (13.72m) and 48' (14.63m) lengths, with 9'6" (2.9m) heights and 8' (2.44m) and 8'6" (2.59m) widths, respectively. To ensure compatibility with existing container handling equipment corner fittings on these units were placed at the ISO 40' positions. From these experiments it



was found that the 48' X 8'6" X 9'6" (14.63m X 2.59m X 2.9m) containers have the following advantages: (1) an internal volume of 2.9 TEUs, (2) they permit double-stack container platforms --five platforms equal one wagon- to carry 4.9 TEU instead of 4.0 TEU and (3) they allow two European standard 1.2m X 0.8m or 1.2m X 1.0m pallets (3.94' X 2.62' or 3.94' X 3.28') or two US standard 48" (1.22m) pallets to be loaded side-by-side. In recognition of these advantages, during the first quarter of 1986 the US National Railroads Intermodal Association adopted this dimension as the domestic container size. In addition, it is being tested by Canadian National Rail; numerous container manufacturers such as Jindo of South Korea and Synergen, Adamson and Yorkshire Marine in the United Kingdom have received orders for these new units; Sea Containers is acquiring 25 units for leasing; and Navieras de Puerto Rico has begun to lengthen some of its 40' units to 48'.

The utilization of over-wide, non-ISO containers is not limited to North America. Intercontainer, the European railways joint venture, for instance, has 390 2.5 meter (8' 2.5") wide units of various types and recently purchased thirty 40' ISO units with side-access doors of the same width for use in the European Container Pool (ECP). The ECP was established in 1983 and currently has 12 European railroads as members. Units of 2.5m width are now being referred to as the trans-Atlantic or Europallet container.

With all this activity related to intermodal efficiencies and the 48' X 8'6" X 9'6" containers, ocean-liner carriers are faced with the following question: Is there a trend away from ISO standards? As a partial response to this question, it must be remembered that there are at present only 1 700 of these 48' units, compared with almost 4 million standard ISO containers. During 1986 APL ordered 6 500 containers, none of which were 48' units, and five 3 800 TEU vessels of 896' (273.1m) length and 129' (39.32m) beam for its trans-Pacific services. These vessels will be the first container ships with beams which exceed the maximum width of 106' or 32.31m for transit through the Panama Canal. They are designed to carry ISO 20' and 40', as well as 45' and 48' units. Numerous shipping lines, as well as the technical secretariat of ISO Technical Committee 104 (TC 104), consider that there is a real possibility of the 48' units being utilized more extensively by Asian and European exporters to the USA. Due to the need for Latin American exporters to interface smoothly with land transport systems not only in the USA but also in Europe, and as the interface requirements of those markets are quite different, the commercial acceptance of this non-ISO unit must be carefully watched.

### C. Port and inland transport technologies

There are a number of areas in which new technologies are changing the traditional relation between liner vessels, ports and hinterlands. Some of the more important are related to (1) cranes and marshalling yards, and (2) inland transport.

1. Crane and marshalling yard technologies. The research and development activities of crane manufacturers largely seek to reduce the time vessels spend in port loading and discharging containers, operating and maintenance costs, and the purchase price as well as installation costs. In this context, numerous electronic aids have been added in order, inter alia, to increase travel speeds and assist in spotting containers --which is

estimated to account for approximately 50 per cent of cycle time. Specialists in the field project that by the end of this century major reductions in vessel port-stay times at high-volume ports will be achieved by lifting containers in groups of eight or 10, or by utilizing high-capacity gantry cranes with sea-side and shore-side trollies which are capable of 100 container moves per hour. The future may prove such projections correct but, one might ask, how much will these cranes and the necessary shore-side equipment cost, what volume of containers is necessary to justify that cost, and are there other less costly means of accomplishing the same objective?

A crane capable of lifting approximately 300 tons (10 containers of 30 tons each) would not only be very expensive but also heavy. Existing docks at even the most advanced ports might have to be reconstructed for such cranes, as well as the point loading requirements for 10 containers. It should be noted that cranes of this capacity are usually on barges to eliminate the need for such special construction. In addition to these difficulties, existing landside container handling and transport equipment could not cope with the projected maximum output of either multiple-lift or high-capacity cranes. Indeed, one can imagine the congestion of approximately 100 straddle carriers under two high-capacity cranes trying to move 200 containers per hour. Some crane manufacturers have gone so far as to indicate that, in the movement of containers from multiple-lift or high-capacity cranes to storage areas, existing handling and transport equipment would be inadequate and that it would be necessary to consider some type of conveyor system. Of course, the conveyor system is not new and Matson Terminal's mousetrap system, which eliminates the gap between the ship and storage area gantry cranes, might be considered a simplified working example. Another would be the more traditional overhead conveyor which receives containers from and delivers them to ship gantry cranes as well as storage areas.

With these considerations in mind, research might be fruitfully directed towards the modification of existing cranes to increase their productivity. These efforts might indicate that major productivity increases could be obtained by a change from serial to simultaneous loading and discharge operations through, for instance, the utilization of double-spreader cranes. A double-spreader crane would operate like a single-spreader, except that the former would lift ship and shore containers at the same time and the two units would rotate 90 degrees at mid-boom to permit such units to pass. Double-spreader cranes should be only marginally heavier than existing single-spreader units, thereby permitting the use of existing docks. The operation of double-spreader cranes would have to be carefully synchronized with activities aboard ship, at the interface between the cranes, and container handling equipment and in the storage areas, otherwise sequencing would be impossible, but this is also true for high-capacity and multiple-lift cranes.

Marshalling yards of the future will be fully integrated into gantry crane and inland transport operations. This integration will involve electronic aids to assist in the identification, transmission and storage of information related to such units and their cargoes. Since containers are used in the commercial flows of almost all countries, the type of electronic aids they carry for automatic identification must be readable in virtually every port and interior cargo terminal in the world. The major obstacles to the use of such electronic aids are not just their cost, which has been decreasing in the last two or three years, but also the lack of international

standards which will ensure that they can be used throughout the world. Recognising this as a prerequisite for further progress in automated identification systems, the Maritime Administration of the US Department of Transportation has established a research and development group composed of ship operators whose vessels are registered in the US and a variety of representatives from other sectors of the industry. This group has contracted with the association of Automatic Identification Manufacturers to develop a US national standard. The major risk involved in these efforts for other countries is that the US national standard could easily become an international standard, as occurred with ISO-standard container dimensions (see part III.B).

2. Inland transport technologies. From the earliest days of containerization extensive inland movement has always been a theoretical possibility, but numerous factors have combined to change that possibility into an economic and practical reality for Europe and North America. One of the most important factors which contributed to such change in North America was double-stack container wagons, which allow two ocean containers to be stacked atop each other for inland railway transport.

Since the Second World War intra-European cargo movements have been dominated by road transport. The reasons for this are found in the virtual destruction of alternatives during the War, the relatively short transport distances, design advances in road transport equipment, and low-cost petroleum products prior to 1973. During the early 1970s European railroads began to look at different alternatives which would allow them to participate in the intra-European movement of goods. As a result, the railroads began to develop intra-European, non-ISO, non-stackable containers of various lengths and heights, but usually 2.5 metres (8' 2.5") wide, which are compatible with road transport requirements. These containers, or swap-bodies as they are called, are of light construction and have lifting points only at the bottom corners.

In 1967 European railroads combined to form a joint venture called Intercontainer for the transport of swap-bodies and ISO units between participating countries. Today 12 European nations participate in Intercontainer and approximately 50 per cent of all European COFC and TOFC movements utilize swap-bodies. To facilitate the movement of ISO containers between Western European countries the Marine Container Rail Agreement was adopted to provide general conditions of carriage. Intercontainer operates common-user Trans Europe Container Express (TECE) trains on 14 key routes, almost all having up to five or six trains per week in both directions, with an average length of haul of 515 kms. Only 50 per cent of all swap-bodies and ISO units handled by Intercontainer are transported on block trains. In addition to the TECE trains, Intercontainer operates other private-user trains on similar routes. Of the 5.4 million swap-bodies and ISO units transported on European railroads during 1985, Intercontainer carried 904 803, which is a 9.7 per cent increase over the previous year. It forecasts that the total number of swap-bodies and ISO units carried during 1986 will decrease to around 877 000 units, due to a weakening of international trade.

While swap-bodies are not interchangeable between land and sea modes, to a limited extent they are carried by trucks on roll-on/roll-off vessels in European short-sea trades. It has been estimated that a 23' 5.5" (7.15m)

swap-body constructed in Europe not only costs approximately US\$ 3 600, or twice the price of a comparable ISO unit from a Far East manufacturer (US\$ 1 500-1 800), but is also more expensive to repair. Numerous terminal operators report that they are slower to load and unload from trailers and railway wagons than ISO units, as they have only bottom corner fittings, and occupy the storage space of 4-6 ISO standard TEUs due to their non-ISO dimensions and non-stackable characteristics. One specialist in the matter has suggested that if swap-bodies, which currently number approximately 50 000-60 000, were replaced with ISO units it would ensure intermodal compatibility with ocean carriers and, at the same time, reduce investment and repair costs. With the advent of Europallet containers constructed to ISO standards, one might ask if swap-bodies will continue to be utilized for intra-European cargo movements in the medium and long term.

During August 1986 TC 104 of the ISO sent out a questionnaire to member countries concerning standards for swap-bodies and found that only 33 per cent consider such standardization necessary. The European Committee for Standardization (CEN), established in 1961 and composed of national standards bodies from 16 European Economic Community (EEC) and European Free Trade Association member States, held a meeting on 5 November 1986 to consider the same matter. While no decision was taken concerning the adoption of standards for swap-bodies, a new technical committee for standardization of swap-bodies (CEN/TC 119) and two working groups were established (WG 1 on weights and dimensions and general specifications, and WG 2 on testing), and a schedule of meeting for 1987 was agreed to.

In contrast, the USA has not, as yet, developed a domestic container such as the European swap-bodies, and until the early 1980s there was very little inland movement of ISO units. Inland transport in the USA of ISO containers became a practical reality with the deregulation of the road and rail transport industries in 1980. In general terms, the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980 sought to remove bureaucratic constraints on competition and increase productivity through service and technological innovations. Since these acts were adopted, loss-making routes have been eliminated and new labour agreements have been negotiated, but the new maximum land transport dimensions, discussed in part III.B., and double-stack container railway wagons have been major contributors to such productivity increases. While double-stack container wagons were introduced by Southern Pacific Transportation Company (railroad) and operated by SLS between Los Angeles, California, and the US Gulf Coast as early as 1981, it was APL which took the step in April 1984 of committing itself to a regularly scheduled double-stack block train service after successfully testing the concept a year earlier.

There are numerous variations in the design of double-stack container wagons, but it can be generally stated that such wagons are approximately 280' (85.34m) long and composed of five articulated platforms. Each platform carries four TEUs each, with 20 TEUs per wagon. The number of articulated double-stack platforms utilized to form trains varies between 20 and 28, which results in capacities of from 400 to 560 TEUs. On the other hand, as APL utilizes one 48' X 8'6" X 9'6" container on the second tier of each platform, a 20 platform train would carry not 400 TEUs but rather 490 TEUs. Containers are secured for transport either by the use of bulkheads at each end of platforms or by the use of interbox connectors between the corner fittings of the base and stacked containers. A standard railway wagon weighs approximately 31.9 metric tons, while the articulated double-stack container

wagon weighs only 14.6 metric tons or 54.2 per cent less. The reason for this is that a single five-platform, double-stack container wagon has 80 per cent fewer couplers and 40 per cent fewer wheels and brakes than the equivalent five conventional flat railway wagons. In effect, a double-stack train can accommodate more than twice as many containers as a conventional train, with little increase in locomotive power and no increase in crew size.

It has been estimated that locomotives pulling double-stack container wagons will consume only 60-67 per cent as much fuel per container as conventional COFC and TOFC operations. One US railroad has indicated that double-stack container wagons will average 225 000 miles per year, instead of the 80 000 miles per years for flatbed railway wagons, and that double-stack container wagon maintenance costs, on a per-container basis, are as low as 12 per cent of those for conventional equipment. The per-container line haul cost savings of double-stack container trains over conventional TOFC and COFC operations is approximately 40 per cent, which results in an estimated rail-haul cost of US\$ 0.40 per mile per container. Thus, double-stack railway operations represent a major productivity breakthrough which has enormous implications for the entire distribution chain.

The European and USA initiatives in inland transport technologies are important to Latin American and Caribbean countries, as they must have a smooth interface with each. This creates numerous problems, since these technologies are quite different and 48' X 8'6" X 9'6" units presently would not be permitted on most European roads. Nonetheless, Asian and European exporters might come to see the 48' length as a means of making greater use of North American road and rail transport economies. Japan, for instance, with an average inland transport distance for containers of only 39 kms could permit the use of the 48' units without greatly increasing overall distribution costs. On the other hand, European exporters have already begun to look at the 8' 6" (2.59m) and 8' 2.5" (2.5m) widths as providing such economies with reference to their standard pallets.

#### D. Computer and communication technologies

In 1966 the international transport of containers was a matter of vision, but a mere four years later they had become the basis of ocean-liner transport. Twenty years later the use of computers in ocean-liner transport is likewise often a matter of vision, but within a very short period of time computers will become the fundamental basis for operation and control of containers and their cargoes, charter arrangements, consortia and the diverse elements of the distribution chain itself. The ocean-liner industry has been slow to see the advantages of computer applications for its daily activities, but the prospects of real commercial gains will be an important incentive for their utilization. Computers are no longer a "management aid", but rather a "production tool" which will accelerate the market, service, technological and legal forces now transforming liner shipping. The aspects of computers as a production tool and a means of acceleration are so important that the impact of the silicon chip on liner shipping has been compared with that of the container in 1960: just as the container totally transformed ocean-liner transport, so also will the computer and modern communications technology. The areas in which computers find their greatest applications in ocean-liner transport are related to ship operations, container operations, communications between ships and ports, and communications between ports,

inland transport modes, interior cargo terminals and national Customs authorities.

Vessel applications of computers include bridge, engineroom, cargo and administrative functions. Computers help persons in each of those areas to gather, analyze, integrate and transmit data related to position, speed, weather, fuel consumption, repair functions, stability calculations, tank levels, draught, temperature, documentation and accounts, as well as to carry out training, inventory and word processing activities. For example, it has been estimated that approximately 75 per cent of all major spare parts (in US dollar value) originally placed aboard a ship are never used. Computer applications to the repair cycle and functions have permitted a 30 per cent reduction in repair costs and a decrease in inventory investment requirements.

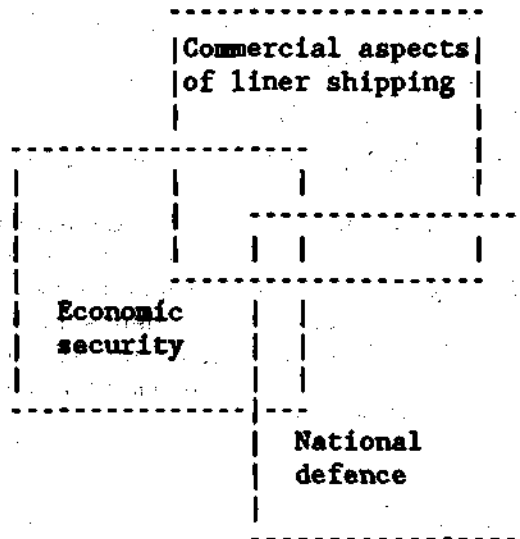
Computers can assist shoreside container operations to ensure the maximum utilization of the cubic space in such units, prepare vessel loading plans, reduce restows, prepare commercial documentation and control container inventories. With reference to the latter, a European liner company has found, upon adopting a computerized inventory control system for containers, that its manual system resulted in as many as 25 per cent of such units not being ready for service.

Communication technology permits vessels to communicate with ports regarding existing container stowage, tank contents, etc., so that the port offices can prepare discharge and loading plans, determine equipment requirements and identify shoreside storage locations for incoming and departing containers. These communication links are also utilized to provide information related to navigation and weather routing. In a similar manner the same technology permits ports to communicate with inland transport modes, interior cargo terminals and national Customs authorities. For example, Customs authorities can receive information regarding goods which are to enter and leave the country many days before the vessel arrives. With such information containers can be preselected for inspection, while others can be precleared if all required documents have been filed. The computers of Burlington Northern, a United States railroad, automatically transmit data (without human intervention) concerning the containers, their contents and destinations on its trains to other computers at the port of Seattle, Washington, before the cargo has departed Chicago for that port.

To take full advantage of the systems approach, intermodalism requires the co-ordination of all activities in the distribution chain. Only computers and modern communications technology can cope with the complexity of integrating an astronomical number of diverse activities in the distribution chain in order to create the necessary institutional and physical ties, as was presented at part II.C. Computers and communications technology not only place seemingly disparate elements of the distribution chain together in imaginative ways but also permit a total, global dialogue between all such elements. As a result, computers and communications technology have made an important contribution to the modification of the traditional ocean-liner concepts of "acceptable times" for the movement of goods, "necessary space" for goods handling and storage, "location" of the goods and "responsibility" for delays and damage to them. In effect, the integration of activities in the distribution chain by computers and communications technology precludes any consideration of them individually, as integration has changed such activities both in nature and scope.

#### IV. THE EMERGING LEGAL ENVIRONMENT

Ocean-liner transport is such a dynamic and permanently evolving field that the legal regimes which govern its activities should be forward looking and, if possible, should anticipate changes. Without such a focus they can become rigid structures which enshrine historical practices, institutions and technologies, instead of providing needed flexibility and instruments to deal with the future. In elaborating legal regimes for ocean-liner transport, most countries give consideration to the following three overlapping areas:



The importance and relative weights given to these areas by a particular country and the means utilized to satisfy each of them result in an explicitly or implicitly stated ocean-liner transport policy. Due to the wide range of interests each of these areas represents, ocean-liner transport has an intimate relation with other government policies, and it is in the political arena where one must first look for changes. Indeed, it might be said that the commercial aspects of ocean-liner shipping are controlled by non-market considerations --economic security and national defence-- and any attempt to separate ocean-liner transport from the general economic, industrial and political environment is not only impossible but would result in a meaningless exercise.

The relevance of this intimate relation can be seen from the service innovations which have come about in the last two-to-three years. To understand these innovations it should be highlighted that the physical elements of modern liner shipping --containers, specialized cranes, cellular vessels, etc.-- have existed since the mid-1960s, but new legal regimes and those under discussion permit such elements to be utilized differently or in new combinations. This is something like rewriting the rule book for chess and permitting a piece that could only move in two directions to now move in four or six or in combination with other pieces. The process of learning to operate liner vessels according to new and constantly evolving competition rules is not easy, but it is necessary for survival.

In this context, the legal measures which are being elaborated or have already been adopted by (a) developed countries, (b) developing countries and (c) jointly by developed and developing countries must be evaluated in order to answer many questions. Some of the more important of these are: What impact will these regimes have on fleet development programmes and trading economics of Latin American and Caribbean countries? What organizational and operational changes are needed for Latin American and Caribbean shipping lines to anticipate the emerging legal environment of ocean-liner transport? Does the emerging legal environment accelerate, anticipate or restrict the market, service and technological forces which are restructuring the industry? What new commercial relationships should be created? Which old ones must be terminated? Until these and many other questions are answered liner companies will be compelled to operate in a political environment so disperse that they literally cannot tell from one day to the next what strategies and plans are most appropriate.

#### A. Measures adopted by developed countries

Probably the most important legislation adopted by developed countries for the ocean-liner industry are (1) the US Shipping Act of 1984 and (2) the proposal to include liner shipping within the European Community's Treaty of Rome. Of course, there are many other legal instruments such as Lomé III and Note 1 to Annex A of the Code of Liberalization of Current Invisible Operations (CLIO), as well as quasi-legal instruments which result from US/Consultive Shipping Group (CSG) discussions.

1. The US Shipping Act of 1984. This Act is more than just another national law for four reasons: first, approximately two-thirds of all liner vessels call at US ports and, therefore, must comply with its requirements; second, the new tools it creates for the industry -- service contracts, time-volume rates, independent action, extension of antitrust immunity to intermodal combinations and rates, shippers negotiating directly with lines rather than via conferences, and shippers' associations -- are supportive of the market, service and technological forces which are restructuring the industry; third, lines can now respond rapidly to changes in trade demand, as all agreements filed with the Federal Maritime Commission (FMC) -- other than assessment agreements -- become effective 45 days after filing, unless the FMC seeks injunctive relief; and fourth, many countries, such as Canada with the proposed revision of its Shipping Conferences Exemption Act, are studying the experience of the Act with a view to modifications to their own legislation. Due to the importance of this Act for ocean-liner transport, it will be evaluated with reference to (a) enforcement philosophy, (b) commercial implications, (c) national economic security and defence aspects, and (d) specific clauses of this and other related US maritime legislation which are of interest to ocean-liner companies.

a) Enforcement philosophy. Many articles and even books have been written in an effort to explain the Shipping Act of 1984. However, a spokesperson for the FMC at a conference sponsored by it and the Old Dominion University, 12-13 June 1986, held at Norfolk, Virginia, USA, indicated that

"Whenever any industry is subjected to a major modification of the regulatory scheme under which it functioned for decades, it can be



expected that it will take many years for the players to sort out all of the new information they receive about the changed environment and make the appropriate adjustments."

It would appear that three situations must occur for the Act to be fully understood: that is, ocean-liner transport must pass through the stages of being (1) a buyers' market and (2) a sellers' market, and (3) the FMC must have approximately 10-15 years to interpret the creative manoeuvres of lines, conferences and shippers which seek to reduce what are seen as unnecessary burdens. Due to chronically overtonnaged trades, the growing use of intermodal landbridges and large-scale vessels, and the fact that freight rates (in real terms) are at 1977-1979 levels, the liner industry is currently a shippers' market. For example, the Director-General of the Far Eastern Freight Conference (FEFC) recently remarked that during the last two years almost every major shipper has negotiated individual rate reductions, sometimes by quite large amounts, but usually ranging from 10 to 20 per cent. Until this situation is reversed, numerous provision of the Act will not be utilized nor fully understood. Once the pendulum in this cyclical industry has swung to create a sellers' market, vessel operators will begin to see aspects of the second situation.

With reference to the third situation, in interpreting the Shipping Act of 1984 the FMC will be influenced by the legislative history of the Act, the large body of case law related to ocean-liner transport it has developed over the years, information from the trades it monitors, and the enforcement philosophy of the FMC's new Chairman Mr. Edward V. Hickey. Mr. Hickey recently stated that he would do everything in his power to employ quickly and aggressively the statutory weapons contained in sections 13(b)(5) of the Shipping Act of 1984 and 19 of the Merchant Marine Act of 1920 when the circumstances warrant. The statutory weapons to which he referred will be treated at part IV.A.1.d) below. However, counterbalancing Mr. Hickey's declaration is section 13(b)(6) of the Act which provides that

"Before an order under this subsection becomes effective, it shall be immediately submitted to the President who may, within 10 days after receiving it, disapprove the order if the President finds that disapproval is required for reasons of the national defense or the foreign policy of the United States."

Interpretation of the Act will also be influenced by section 18 which provides for a review five years after enactment and establishment of an Advisory Commission on Conferences in Ocean Shipping. One of the major issues to be considered by the Advisory Commission is whether the US would be best served by prohibiting conferences, or by the existence of closed or open conferences. Of considerable weight in this matter will be the homogeneity of containers and the interchangeable nature of liner services, as were explained in parts II.A. and II.B., and the role accorded the ocean-liner industry in US national policies. To provide the Advisory Commission with the information needed for such determination, the FMC itself has begun to gather information by questionnaires from seminar participants, liner operators and many others. The FMC is monitoring trades, rather than gathering information on a case-by-case basis, and this implies an even more active role for it in ocean-liner transport.

b) Commercial implications. The Act presents shippers with new opportunities to deal with carriers. Prior to the Act shippers could only negotiate with conferences, but now they can negotiate directly with any one line, a group of lines or the conference itself, as well as establish shippers' associations. These associations are defined at article 3(24) as

"...a group of shippers that consolidates or distributes freight on a nonprofit basis for the members of the group in order to secure carload, truckload, or other volume rates or service contracts."

The Act includes shippers' associations as a means of balancing the strengthened antitrust immunity of liner conferences and the negotiating power given large shippers through time-volume rates and service contracts. Without shippers' associations, liner operators would be able to recover any freight revenue lost through concessions made to large shippers by raising rates for shippers with small quantities of goods. In order to provide small shippers with equal access to time-volume rates and service contracts, the Act provides that they may form associations and that carriers may not refuse to negotiate with such associations. The US Department of Justice has issued guidelines for its approval of such associations: any one association must not control more than 35 per cent of cargoes on offer, and the transport cost must not exceed 20 per cent of the final commodity price.

If the market, service, technological and legal forces which are restructuring ocean-liner transport result in a spin-off or separation of containers from the liner industry, service contracts and time-volume rates, as well as the earlier mentioned legislative tools, should form the basis for their carriage under contractual arrangements. An indication of such a tendency can be seen from the 6 568 service contracts which were filed with the FMC by 30 September 1986, and from the declaration of the International Council of Containership Operators that in the trade from the Far East to the US West Coast over 70 per cent of all liner cargoes are now subject to service contract arrangements. The FMC has indicated that of the 6 568 contracts filed with it 75 per cent involve non-conference carriers, thus indicating not only the growing strength of those carriers but also the impact of the forces which support the increasing use of service contracts. EL alone has filed more than 20 per cent of all service contracts, and many of those are with small shippers and shipper associations. The use of service contracts is not restricted to US trades and, for instance, Asian shippers to Europe are now demanding the right to use such new tools. In this context one might ask if service contracts will spread into all major trades and, if so, what their impact on the liner conference system will be.

Some years from now, academic discussions may be held concerning the weakening of the liner conference system and whether this was caused by the Shipping Act of 1984 or the homogeneity of containers and the interchangeable nature of ocean-liner transport services, as set forth in parts II.A. and II.B above. It has been estimated that for a liner conference to stabilize freight rates and minimize competition in a trade route, its members must control approximately 80-90 per cent of the cargoes. The FEFC, however - to take one example - recently indicated that 47 per cent of eastbound and 37 per cent of westbound cargoes are now transported by non-conference carriers. Certain conferences have begun to regulate and/or prohibit the use of service contracts, as permitted by section 4(a)(7), in response to shippers' demands for "most favored shipper" provisions in their contracts. Such provisions require amendments to service contracts if carriers offer lower rates to

other shippers. However, whether or not the Act contains provision for service contracts is considered largely irrelevant, as other homogeneous cargoes such as petroleum, minerals, grains, automobiles, paper, lumber, etc., separated from liner shipping without earlier legal initiatives. Thus, the growing use of contract carriage arrangements for ocean-liner transport reflects the market, service and technological forces which are restructuring the industry, and the Shipping Act of 1984 merely supports those forces.

c) National economic security and defence aspects. For many years the US Government has maintained its national merchant marine through a combination of subsidies and cargo reservation regimes. As examples, US liner operators receive operating-differential subsidies (ODS) and construction-differential subsidies (CDS), as well as reservation regimes which are applicable to coastwise, military and economic assistance cargoes. Between 1980 and 1985 the ODS grew from US\$ 341.4 million to US\$ 351.7 million, while in the same period the CDS decreased from US\$ 265.1 million to US\$ 4.7 million. With a few notable exceptions, the magnitude of these subsidies and reservation regimes make US liner shipping one of the most highly protected of those in market-economy countries. Originally, each of the above measures sought to harmonize the commercial, economic security and defence aspects of the country's national maritime policy. However, as these three areas are endlessly complex in their ramifications, differences in interests among shipbuilders, ship operators, cargo owners, the armed forces and others have led the US Government to seek measures which would treat them individually.

With reference to the first or commercial aspects of international liner shipping, the US operating-differential subsidy assists its vessel operators with the high US labour costs, in order that they may compete with shipping fleets of other countries. For example, typical daily wage costs for a Taiwanese flag containership are US\$ 1 500, while those for a European vessel are US\$ 4 200 and for a US vessel US\$ 8 500. Under circumstances such as these the operating-differential subsidy can make the difference between continued presence in a trade or withdrawal. In this context, numerous efforts have been made to introduce legislation in the US Congress which would permit US liner operators to buy, build and charter new tonnage on the open market, rather than from US shipbuilders, and yet still qualify for all existing subsidy payments. One can imagine the benefit such initiatives would have provided to USL (see part II.D above), as it owned and operated foreign built vessels, and was therefore not entitled to an operating-differential subsidy under present legislation.

The US Government treats the remaining two areas -economic security and national defence- of its ocean-liner policy on an individual basis. Defence requirements are fulfilled through the US Military Sealift Command's Ready Reserve Force of 89 vessels, which is to be expanded to 112 vessels by 1991, while economic security is considered adequately satisfied through US owned fleets that are registered under its laws as well as those of other countries. Similarly, certain European nations with long experience in liner shipping indicate that they treat these three areas separately. Indeed, at times such countries even deny that special consideration is given to economic security and national defence issues. For such countries these latter issues are usually covered by economic union agreements, continental transport alternatives and mutual defence treaties which are of such magnitude as to eliminate any need for their consideration in an ocean-liner policy. These nations also assert that their fleets receive only interest

equalization or local shipbuilding subsidies and cargo reservation for domestic trades, but the major subsidy comes from the internationalization of their fleets through the use of low-cost foreign crews.

The individual treatment of the commercial, economic security and national defence aspects of ocean-liner transport by the US and other developed nations has important implications for developing countries which either do not have sufficient means to deal with such aspects separately or have taken a national, sovereign decision to deal with them in another manner. The impact of the evolution from joint to individual treatment of these three areas of ocean-liner policy could be enormous for shipping lines of other countries, if access to their own trades with Europe and the USA is conditioned on use of substantially the same means to support their liner operators.

d) Specific provisions of US maritime legislation which are of interest to ocean-liner companies. To ensure access for US vessels in cross or non-US trades and for all vessels in direct US-foreign trades, sections 13(b)(5) of the Shipping Act of 1984 and 19 of the Merchant Marine Act of 1920, respectively, provide the FMC with broad powers. The regulations for these sections permit the FMC to institute proceedings on its own motion or upon the filing of a petition.

The regulations for section 13(b)(5) of the Shipping Act of 1984 are found at 46 Code of Federal Regulations (CFR) 587 and enumerate conditions which are considered to unduly impair access of US vessels to trades between non-US ports, including any intermodal movements related thereto, as well as establishing procedures under which US liner operators may apply to the FMC for relief. However, any limits, restrictions or requirements placed upon US vessels for participating in non-US trades will not be subject to FMC review unless a US liner operator is commercially able to enter the trade in question.

As was noted at part IV.A.1.(a), the enforcement of section 13(b)(5) is limited by section 13(b)(6). Nonetheless, 46 CFR 587.2 enumerates a wide range of conditions which are defined as unduly impairing the access of US-flag vessels to non-US trades. The two areas of fundamental interest for Latin American and Caribbean liner operators are those related to subparagraph (b)

"Reservation of a substantial portion of the total cargo in the trade to national-flag or other vessels which results in a failure to provide reasonable competitive access to cargoes by U.S. flag vessels."

and to the inclusion of intermodal movements in such transport operations.

Pursuant to subparagraph (b), the FMC must define the expression "... provide reasonable competitive access to cargoes by U.S. flag vessels" in the light of US reservation schemes for coastwise, military and economic assistance cargoes, as well as bilateral cargo sharing agreements. Turning the requirements of this subparagraph around, does it mean that the US will eliminate such regimes and agreements in order to "provide reasonable competitive access to US cargoes by non-US flag vessels"? With reference to intermodal movements which form part of non-US trades, one can imagine, for

instance, USL's trans-Pacific service discharging Asian cargoes at Los Angeles, California, for on-carriage by its feeder vessels to either Chile or Peru and from one of those countries to La Paz, Bolivia, by land transport. In the absence of clarifying decisions by FMC administrative law judges or policy statements by the Chairman of the FMC in these matters, one can assume a certain intent but it is most difficult to determine the scope that will be given to the practical application of such provisions.

The regulations for section 19 of the Merchant Marine Act, 1920, are found at 46 CFR 585 and define conditions resulting from actions of governments or from competitive methods or practices which are unfavourable to shipping in the foreign trade of the US. The definitions of these conditions are quite similar to those of 46 CFR 587.2, and create two areas of interest for Latin American and Caribbean liner operators. The first is found at 46 CFR 585.3 (b) and relates to conditions which

"Reserve substantial cargoes to the national flag or other vessels and fail to provide, on reasonable terms, for effective and equal access to such cargo by vessels in the foreign trade of the United States;"

This subparagraph would seem to recognize implicitly the validity of national cargo reservation regimes, if such regimes provide, on reasonable terms, for effective and equal access to such cargo by other vessels in the foreign trade of the USA. It seems to indicate that only if cargo reservation regimes fail to make such provision would they be considered an unfavourable condition in the foreign trade of the US. Of course, what constitutes "equal access to such cargo" is left to the FMC to define. In the present, chronically-overtonnaged market a mathematically exact equal access could result in no liner operator having a large enough load to justify a voyage economically. It should be highlighted that this section of the Act has been given renewed vigour and applied to the cargo reservation schemes of the Philippines and Venezuela, and the FMC is currently studying cross-trader access to the trades between the US and Argentina and Brazil.

The second area of interest is at 46 CFR 585.3 (d), and relates to conditions which:

"Are discriminatory or unfair as between carriers, shippers, exporters, importers, or ports or between exporters from the United States and their foreign competitors and which cannot be justified under generally-accepted international agreements or practices and which operate to the detriment of the foreign commerce or the public interest of the United States."

This subparagraph would seem to indicate that discriminatory conditions are justified or accepted if they are carried out pursuant to a generally-accepted international agreement. In this context, the United Nations Convention on a Code of Conduct for Liner Conferences entered into force on 6 October 1983 and would, therefore, seem to be a generally-accepted international agreement. Due to the well-known position of the US Government against the Code of Conduct, it might be pertinent to question if this clause permits liner conferences to apportion cargoes among their members in US-foreign trades.

2. Liner shipping under the Treaties Establishing the European Communities (Treaty of Rome). Maritime transport is dealt with at Article 84 of Title IV. That article states that:

"The provisions of the Title shall apply to transport by rail, road and inland waterway. The Council may, acting unanimously, decide whether, to what extent and by what procedure appropriate provisions may be laid down for sea and air transport."

The structure of this article is quite different from those which treat other areas in which the Community has established common policies. Such articles usually include detailed instructions for the Council Regulations to be issued. The reason for utilizing the above structure can be found in the view of maritime transport held by the original six EEC Member States, who considered it to be a national matter governed by the laws of each country, conference agreements and the market, as well as their need to create a "common market" through an increase in commercial exchanges between themselves. As a result, for many years the principal focus of the transport activities of the Commission of the European Communities was related to road, rail and inland waterway cargo movements between member countries.

Notwithstanding the early transport focus of the EEC Member States, numerous factors in the last 15 years have contributed to a growing awareness of the need to establish a common EEC shipping policy. In this context, one might highlight the 1973 decision of the European Court of Justice, which held that Article 48 of the Treaty of Rome --related to the free movement of labour-- applies to seamen, the increasing presence of non-commercial competition, chronic overtonnaging, bilateral transport arrangements, national cargo reservation regimes, the United Nations Convention on a Code of Conduct for Liner Conferences, adoption of that Convention by various member States, together with Council Regulation 954 of 1979 (better known as the Brussels Package), and the US Shipping Act of 1984.

In response to these factors, and as an expression of EEC support for the US Shipping Act of 1984, on 22 December 1986 the Council of Ministers adopted the following Council Regulations: (1) Number 4055/86, applying the principle of freedom to provide maritime transport services between Member States and between Member States and third countries, (2) Number 4056/86, laying down detailed rules for the application of Articles 85 and 86 (the Rules on Competition) of the Treaty of Rome to maritime transport, (3) Number 4057/86, on unfair pricing practices in maritime transport and (4) Number 4058/86, concerning co-ordinated action to safeguard free access to cargoes in ocean trades. In addition to the four Regulations adopted, the Council of Ministers also had before it proposals (1) to establish consultation procedures between EEC members and third countries, (2) to provide criteria for defining a national shipping line under the Code of Conduct and (3) to include within Regulation 4055/86 the freedom of all EEC nationals to engage in the cabotage trades of any Member State, with a 10-year transition period. As there was no agreement on the structure and application of these additional proposals, however, they were set aside.

As in the case of the US Shipping Act of 1984, in order to understand the above four Council Regulations ocean-liner transport must be a buyers' market, a sellers' market and Community authorities must have 10-15 years to interpret the creative manoeuvres of lines, conferences and shippers which seek to reduce what are seen as unnecessary burdens. Due to the scope of

these four Regulations, when compared with that of the US Shipping Act of 1984, it can be expected that additional Council Regulations will be adopted as the need arises. Notwithstanding these limitations, Council Regulations 4055/86, 4056/86 and 4058/86 have provisions which are important for the bilateral transport arrangements and cargo reservation regimes of Latin American countries and must be carefully studied by each country in the light of their individual policies and goals.

Article 1 of Council Regulation 4055/86 establishes that nationals of EEC Member States may provide maritime transport services between Member States and between Member States and third countries. The scope of this article would appear limited to EEC nationals, but such is not the case. Article 3 requires existing bilateral agreements concluded by EEC Member States with third countries to be phased out in accordance with the timetable provided in Article 2. For carriage between Member States and third countries, in vessels neither owned, operated nor controlled by EEC nationals, the bilateral agreements must be phased out or adjusted to the requirements of the Code of Conduct by 1 January 1993. In exceptional circumstances, where, for instance, EEC liner shipping companies would not otherwise have an effective opportunity to participate in the trade to and from a third country, Article 5 (1) provides for the use of cargo-sharing arrangements and Article 6 (3) permits either the Council or the Member States concerned to take such action as may be necessary to preserve an effective opportunity for such participation.

Article 1 of Council Regulation 4056/86 extends the Rules of Competition (Articles 85 and 86 of the Treaty of Rome) to liner shipping. However, as liner shipping is a cartelized industry, with many carrier and shipper agreements in possible violation of those Rules, Articles 3 and 6 of 4056/86 provide block exemptions from the application of such Rules for agreements between carriers concerning the operation of scheduled maritime transport services and for agreements between transport users and conferences concerning the use of scheduled liner services. These exemptions are subject to the condition that the agreement, decision or concerted practice shall not, within the EEC, cause detriment to certain ports, transport users or carriers, unless such rates or conditions can be economically justified. Most important for Latin American bilateral transport agreements and cargo reservation regimes would be Article 7 (2), which conditions the applicability of the block exemptions on, *inter alia*, not preventing the operation of outsiders in a trade. Liner conferences are permitted to continue their historical practice of utilizing loyalty arrangements, either immediate or deferred rebates, but must now comply with conditions regarding termination rights, periods and penalties.

Council Regulation 4058/86, which seeks to safeguard the free access of EEC Member States and, if mutually agreed, any OECD country to cargoes in ocean trades, could have a major impact on Latin American bilateral transport arrangements and cargo reservation regimes. Article 1 permits shipping companies of Member States or ships registered in a Member State to seek relief when actions of third countries or of their agents restrict or threaten to restrict EEC free access to cargoes. The relief contemplated in Regulation 4058/86 includes diplomatic representation to third countries and counter-measures such as the obligation to obtain a permit to load, carry or discharge cargoes, and the imposition of quotas, taxes or duties. If the EEC has not reacted to a request for relief within two months, Member States may apply national measures unilaterally or as a group. While the provisions of

Regulation 4058/86 are quite clear, they must be understood in the light of the Code of Conduct and the Brussels Package. By adopting the latter two instruments the EEC has recognized the right of all countries to allocate the ocean-liner transport of trade shares, as well as the right of regions to reserve certain aspects of their trade relations for themselves. Thus, it would appear that free access to cargoes is limited by the Code of Conduct (paragraph 4 (a) and (b) of Article 2), as well as by the Brussels Package.

3. Lomé III. Beginning in 1964, the EEC has governed its trade, development and investment relations with former dependent overseas countries and territories through conventions which are negotiated every five years. With the addition of new member States to the EEC, the number of former dependent overseas countries and territories becoming contracting parties to each successive convention has continually increased. For example, during negotiations between the EEC and the United Kingdom for the latter's entrance into the EEC, Mauritius asked to accede to the trade convention in force at that time and was permitted to do so on 30 June 1973. Other countries wishing to accede to the convention led to the adoption of Protocol 22, (annexed to the Acts of Accession to the EEC of the United Kingdom), whereby the EEC offered to 21 Commonwealth countries of Africa, the Caribbean and the Pacific an opportunity to negotiate their future relations within the framework of this trade and investment convention.

The fifth trade and investment convention, known as Lomé III, was signed between 65 African, Caribbean and Pacific (ACP) States and the EEC on 8 December 1984. The financial package of this Convention totals 7 400 million European Currency Units (1 ECU = US\$ 1.02) and provides the ACP States with access to EEC markets for products such as bananas, rum, sugar, etc., and sources of financial and technical assistance for projects and programmes in areas which range from trade promotion to transport and from environment to industry.

The accession of Mauritius to the EEC-ACP Lomé Convention framework at its own request and the continued expansion of the number of eligible ACP States indicate a most flexible attitude on the part of the contracting parties. With the entry of Portugal and Spain into the EEC on 1 January 1986 a number of questions arise concerning the desirability of a protocol, similar to number 22 mentioned above, which would permit Latin American countries to accede to Lomé III. For example, Article 252 of Chapter 3, entitled "Provisions relating to establishment and services", requires reciprocal, non-discriminatory treatment of national firms by all contracting parties. With reference to transport, Article 88 provides that

"The Contracting Parties agree that competitive access to the trade shall not be impaired."

Thus, the questions are: Should Latin American countries seek to become contracting parties to Lomé III? If yes, what would be the impact of this on trade and transport?

4. Note 1 to Annex A of the Code of Liberalisation of Current In-visible Operations (CLIO). The Organisation for Economic Co-operation and Development (OECD) was established by a Convention signed at Paris, France, on 14 December 1960, and currently has 24 market-economy developed nations as members -Australia, Canada, 19 European nations, Japan, New Zealand and the



US. This Convention provides that the OECD shall promote various economic growth and trade expansion policies, and in order to achieve these policies its members agree

"to pursue their efforts to reduce or abolish obstacles to the exchange of goods and services and current payments and maintain and extend the liberalisation of capital movements." (emphasis added).

To carry out the above agreement, on 12 December 1961 the OECD member countries adopted CLIO. Transport services within the scope of CLIO are enumerated at part C of Annex A, while Note 1 provides guidelines for the liberalization of all international maritime transport services and related freight charges. Note 1 contains only three sentences, but they have a large potential impact on the US initiative to include all services (which encompass maritime transport) within the framework of the General Agreement on Tariffs and Trade (GATT). The first sentence provides that residents of one OECD State have an unrestricted opportunity to avail themselves of the international maritime transport services offered by residents of another OECD state. This is followed by a requirement that international maritime transport services "should not" be hampered by measures such as exchange controls, preferential flag treatment or clauses in trade agreements, to ensure that normal commercial considerations "should alone" determine the method and flag of shipment. Finally, the third sentence provides that

"The second sentence of this Note does not apply to the United States."

Even though the second sentence uses the word "should not", thereby indicating that its provisions constitute a suggestion and compliance is discretionary, the US Government clearly indicates from the third sentence that it does not wish to liberalize international maritime transport services. If this interpretation is correct, then why is the US Government seeking to have all services, which include international maritime transport, placed in a GATT framework? Would the US Government permit the national defence aspects of its maritime policy to be subject to GATT requirements of non-discrimination against liner services of other countries in areas such as right of establishment, access to markets and commercial presence, as well as settlement of disputes, most-favoured-nation treatment and transparency of subsidies? It would appear that the US Government either has changed its position since Note 1 to Annex A of CLIO was adopted or has not considered the implications of such liberalization for its maritime transport policy.

5. US/Consultative Shipping Group (US/CSG). It will be remembered that the US Shipping Act of 1916 gave liner operators complete immunity from antitrust laws of that country for any activity covered by an agreement on file and in effect at the FMC. However, a series of US court decision in the 1950s and 1960s eroded that immunity. Liner operators in Europe and the US became increasingly uncertain as to whether an agreement on file with the FMC was sufficient to protect them from an antitrust violation suit. The US/CSG discussions were an outgrowth of the uncertainty surrounding the antitrust immunity provided by the Act of 1916. In recognition of the need to clarify this situation, an important feature of the Shipping Act of 1984 was to explicitly indicate that antitrust immunity includes not only those

activities covered by agreements on file with the FMC but also those entered into pursuant to such agreements.

The CSG members include Belgium, Denmark, Finland, France, the Federal Republic of Germany, Greece, Italy, Japan, the Netherlands, Norway, Sweden and the United Kingdom. In addition to the representatives of those countries, representatives from the EEC and the US also participate in its meetings. As a result of the positive US/CSG contribution to the harmonization of European and US ocean-liner policies as regards antitrust immunity, discussions have continued to be held to ensure that other elements of such policies are compatible. The current focus of US/CSG discussion is related to policies which safeguard and promote competition in all sectors of ocean shipping. At the last meeting of the US/CSG, held at Copenhagen, Denmark, on 28-30 April 1986, a joint statement of the members' conclusions was prepared. The three operative paragraphs of that statement indicate

- "1. They will seek to maximise the amount of cargo subject to competitive access.
2. Whether or not the UN Liner Code applies to their trades, the participants reaffirm their resolve to avoid the introduction of new governmental measures, and to resist measures introduced or encouraged by third countries, where their effect is to exclude or restrict competitive access by each others' shipping lines to cargoes in their trades. The participants will maintain the right of commercially operated non-conference lines to compete freely for liner cargoes.
3. The participants have agreed that they should continue to consult regularly and, where appropriate, to coordinate actions relating to their shipping policies. In particular, they intend to consult on: (i) the means jointly to resist harmful protectionist actions; (ii) the means to improve competitive conditions in shipping; (iii) the means to overcome restrictive commercial practices that have the effect of substantially restricting or closing trades, especially those practices that give effect to restrictive shipping policies of third countries; (iv) each others' regulatory practices; and (v) the future direction of the consultations."

The last paragraph of the joint statement clearly indicates the desire of the US/CSG countries to co-ordinate actions relating to shipping policy. Due to the enormous trading capacity of those countries, this means that international liner policy could be determined in Brussels, Tokyo and Washington. In this context, the co-ordination of shipping policies might result in a common definition of acceptable and unacceptable subsidies. For example, the majority of US/CSG countries utilize some form of direct payments to their merchant fleets or indirect payments through low-cost foreign crews, while those of Latin America rely on cargo reservation regimes. The question is not whether direct payments, use of foreign crews or cargo reservation regimes are correct or incorrect, for they all have their advantages and disadvantages, but whether any group of countries have the right to restrict the means which other countries utilize to support their merchant fleets.

While some of the wording of the above three paragraphs is in general terms, the statement demonstrates a clear joint intention to resist protectionism in ocean-liner shipping by ensuring competitive access of their

conference and non-conference liner operators to the cargoes generated by third countries. This can be regarded as an indication of a possible US/CSG position at the 1988 review of the Code of Conduct, regarding the extension of its scope to include non-conference operators. In the light of US/CSG activities to co-ordinate their shipping policies to achieve common goals, one might ask if Latin American and Caribbean countries should do the same to preserve their own national shipping policies.

#### B. Measures adopted jointly by developed and developing countries

The major legislative efforts of developed and developing countries encompass four conventions negotiated under the auspices of the United Nations Conference on Trade and Development (UNCTAD): a Code of Conduct for Liner Conferences and the Conventions on the International Multimodal Transport of Goods, the Carriage of Goods by Sea (the Hamburg Rules), and the Conditions for Registration of Vessels, as well as the discussions currently taking place at GATT concerning the inclusion of services within its framework. In the light of the market, service, technological and legal forces which are restructuring ocean-liner transport, three areas are of fundamental importance, i.e., (1) liability regimes for the carriage of containers, (2) possible topics for the 1988 Review Conference on the Code of Conduct, and (3) the initiative to include services within the GATT framework.

1. Liability regimes for the carriage of containers. From the earliest days of steam to about 1970 general cargo ships were the supreme workhorses of ocean-liner transport. Until the International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading, also known as the Hague Rules, was adopted in 1924, existing legal regimes permitted almost unlimited freedom of contract and ship operators virtually divested themselves of any liability for cargo loss or damage, however caused, by means of exemption clauses in their bills of lading. However, the Hague Rules circumscribed such freedom by defining, among others, the standards of care for cargoes and the period of responsibility for operators of general cargo vessels. Such responsibility is from "hook-to-hook", or from the time individual cargo units are attached to the hook of a vessel's crane at the port of loading until they are released from the hook at the port of discharge. Within this responsibility regime, at paragraph 2 of article III, carriers are required to:

"... properly and carefully load, handle, stow, carry, keep, care for, and discharge the goods carried."

From the time goods are attached to the ship's hook until they are released therefrom, ocean-liner companies are required to exercise due diligence to preserve the cargo. The ship must be in proper condition to receive the cargo, and the cargo must be loaded with care as well as correctly stowed, lashed and well secured for the intended voyage. With the changes brought about by unit-load systems, one might ask, are these requirements applicable to containers when such units are stuffed and stripped at interior cargo terminals or at factories? Should operators of cellular vessels be required to assume such responsibility when they are no longer involved in the handling and stowage of the goods carried?

The Hamburg Rules were prepared in order to bring the Hague Rules up-to-date and were adopted on 30 March 1978, but have not as yet entered into force. At article 4 the "hook-to-hook" period of responsibility for vessel operators is extended to cover the period during which such operators are in charge of the goods at the ports of loading and discharge. This extension recognizes that shipping lines have progressively begun to look inland and engage in activities both before and after the "hook", but it should be questioned whether it provides sufficient flexibility to recognize the growing role of shippers, consignees and their agents in cargo handling and storage activities, as well as filling and emptying of containers.

At article 5 of the Hamburg Rules the standard of care for cargoes is based on liability for fault. Paragraph 1 of article 5 provides that

"The carrier is liable for loss resulting from loss of or damage to the goods, as well as from delay in delivery, if the occurrence which caused the loss, damage or delay took place while the goods were in his charge as defined in article 4, unless the carrier proves that he, his servants or agents took all measures that could reasonably be required to avoid the occurrence and its consequences."

The commercial practice of loading and sealing containers at factories and interior cargo terminals, as well as the speed with which container ships are loaded and discharged, effectively prevents operators of such ships from inspecting cargoes before accepting them for carriage. If cargoes are found damaged upon opening containers, to exculpate themselves vessel operators must establish where the damage occurred and who is responsible, or compensate the injured party.

With the possible spin-off or separation of containers from ocean-liner transport and their carriage by contractual or charter arrangements, one might ask if the absence of specific legislation portends a return to freedom of contract based upon the negotiating strength of each party. The second sentence of article V of the Hague Rules and the cases decided thereon have been embodied in paragraph 3 of article 2 of the Hamburg Rules. The latter provides a partial answer by indicating that:

"The provisions of this Convention are not applicable to charter-parties. However, where a bill of lading is issued pursuant to a charter-party, the provisions of the Convention apply to such a bill of lading if it governs the relation between the carrier and the holder of the bill of lading, not being the charterer."

It would appear, therefore, that there might be a change of direction towards freedom of contract between shippers and carriers for containers transported under charter arrangements. While there are no conventions which specifically cover this matter, there are numerous sources of experience which could be utilized by the ocean-liner industry to define the extent of such freedom. For example, charter-parties for the carriage of traditional bulk cargoes, related industry practices and guidelines laid down by courts in resolving disputes, as well as the requirements promulgated by the FMC for service contracts filed with it pursuant to the US Shipping Act of 1984, might all provide some orientation for the negotiation of charter arrangements for the carriage of containers. Nonetheless, where and when

these practices and guidelines for bulk cargoes, and the requirements for service contracts in US-foreign trades, might be employed for containers will await a decision of the market place.

2. Possible topics at the 1988 Review Conference on the Code of Conduct for Liner Conferences. Preliminary negotiation on various aspects of a code of conduct for liner conferences began as early as 1967. Such negotiations were later centered at UNCTAD and by 1974 resulted in the approval of the Convention on a Code of Conduct for Liner Conferences. To have a better understanding of the Code of Conduct one must take into account the ocean-liner environment which existed between 1967 and 1974, and the mandatory form in which it was elaborated.

With reference to the ocean-liner environment between 1967-1974, it will be remembered that the first international movement of containers occurred in 1966 and was a trans-Atlantic voyage between the US and Germany. By 1967 there were no more than five container vessels trading internationally, and by 1974 that number probably increased to approximately 50. In other words, the container revolution was at its earliest stages and general cargo conferences controlled ocean-liner shipping. With reference to the diagram in part II.B. above, during the period 1967-1974 the evolution of liner conferences had reached the stage of breakbulk agreements. The Code was elaborated prior to the structural changes brought about by containerization and, of course, prior to the market, service, technological and legal forces which are currently restructuring the industry. This should not be taken as meaning that the Code is not a useful instrument, but merely that it, like many other legal regimes, has been largely overtaken by changes in the industry it seeks to regulate. Thus, the questions facing all contracting parties are: what changes are needed to bring the Code up-to-date and how can those changes, as well as the Code, be structured to ensure that it will not be rapidly overtaken again by future events?

In this context, it is considered that some of the areas which might be discussed at the 1988 Code Review Conference could include individual proposals by developed and developing countries, as well as those made jointly. With reference to the first, developed countries might propose (a) the elimination of article 2 - participation in a trade, and (b) the right of economic communities to become contracting parties to the Code. On the other hand, some of the areas which might be proposed by developing countries could include (a) the allocation of cargo shares by governments rather than conferences, (b) the inclusion of outsiders or non-conference lines within the scope of the Code, (c) a definition of the role of load-centre ports, intermodal-landbridge services, large-scale vessels and their relation to the fleets of developing countries. Both groups of countries might make proposals related to (a) the separation of containers from other liner cargoes and their transport by chartered vessels, (b) the broker activities of conferences, (c) uniform interpretation of the Code, and (d) changes to the structure of the Code which might permit easier and more frequent modifications.

3. The initiative to include services within the GATT framework. In response to section 102(g) of the 1974 US Trade Act, which defines international trade as including commercial exchanges of both goods and services, the US Government at the Tokyo Round of trade negotiations proposed

the inclusion of services. No major concessions were granted on this proposal, as the US and its main trade partners were preoccupied with other issues. However, at the November 1982 GATT Ministerial Session, the US sought to establish a work programme on services in GATT. Strong resistance by developing and certain developed nations led to a Ministerial Declaration which recommended that the GATT Contracting Parties undertake national studies on services and suggested that they exchange relevant information through international organizations such as GATT itself.

The strong resistance by developing countries to the establishment of a work programme on services in GATT is based on a belief that the structure of GATT is inappropriate for negotiations on services, that it lacks experience as well as jurisdiction in those matters and that the spectre of trade retaliation -one country or group of countries restricting the admission of certain goods because other(s) have done the same for its own goods- could be expanded to cross-sectorial or goods/services retaliations. With reference to the latter, the US Trade and Tariff Act of 1984 specifically provides for cross-sectorial retaliation: that is, if a country wishes to reserve a specific service area for its citizens, other countries may retaliate in the form of restrictions against its trade in goods. In the light of these considerations, since the Ministerial Declaration of 1982 and the 1984 Agreed Conclusions of the GATT Contracting Parties, an exchange of information on services has taken place, not within the framework of the GATT agreement, but rather at GATT Headquarters, utilizing its facilities through what is now called the "Jaramillo Track" (for the Colombian Ambassador at Geneva, Switzerland, Felipe Jaramillo, who is also Chairman of the GATT Committee on Services).

The proposal to include services within GATT starts from an assumption that all services are basically alike and can be treated in the same way. Services have historically been separated into factor services or those requiring an investment, non-factor, public, private, producer or those which add value to a product, consumer, etc., but these classifications merely provide a description of the common characteristics of each group of services. While many services do have certain characteristics in common, such as an inability to be stored for future use, the differences between them come not from such characteristics, nor from the activities carried out by each, but from government policies which determine their individual structures. As discussed at the beginning of part IV, the structure of ocean-liner transport is largely determined not by the commercial aspect of such services, which is roughly equivalent to a functional description of that activity, but rather from considerations related to economic security and national defence. Unless and until government policy issues surrounding each service are analyzed, the true nature of services and their relevance in the national development process will not be fully understood.

It is most difficult to liberalize trade in services by treating them all the same or even by grouping them into classes according to functions, activities or characteristics. A more complete understanding of services might be obtained through the preparation of analyses of government policies which determine the individual structure of each service. This would be a complex undertaking, but without such analyses negotiations on services face the very real risk of entering a no-man's land of non-issues, non-papers and non-binding agreements. As an example of the need to analyze government policy issues which determine the structure of a specific service, the US initiative to include all services within GATT is difficult to reconcile with

its rejection of the second sentence of Note 1 to Annex A of CLIO. Indeed, the US position regarding Note 1, as presented at part IV.A.4. above, could well be an expression of economic security and national defence considerations which will not permit its liner shipping to be subject to GATT requirements.

At the meeting of GATT Contracting Parties, held at Punta del Este, Uruguay, from 15 to 20 September 1986, the Ministers decided that a Group on Negotiations on Services (GNS) should be set up and that its activities should be governed by GATT procedures and practices, but conducted separate from those related to goods. The GATT will provide secretariat support, with technical inputs from other organizations as decided by the GNS. The second paragraph of Part II, Negotiations on Trade in Services, of The Ministerial Declaration on the Uruguay Round states that:

"Negotiations in this area shall aim to establish a multilateral framework of principles and rules for trade in services, including elaboration of possible disciplines for individual sectors, with a view to expansion of such trade under conditions of transparency and progressive liberalization and as a means of promoting economic growth of all trading partners and the development of developing countries. Such framework shall respect the policy objectives of national laws and regulations applying to services and shall take into account the work of relevant international organizations." (emphasis added).

The two underlined phrases above clearly indicate that service negotiations must take into account the differences between individual service sectors and the policy objectives for services of individual countries. The multilateral consideration of these factors will assist in shedding light on the structure of each service, and permit the GNS to direct its activities toward those areas where an agreement would be beneficial for all.

#### C. Measures adopted individually by Latin American and Caribbean countries

The legislative efforts of Latin American and Caribbean countries include the adoption of cargo reservation regimes, establishment of state owned shipping lines, creation of maritime transport forums to facilitate regional collaboration, and participation in regional multinational shipping lines. While each of these efforts is important, only that related to cargo reservation regimes will be dealt with in this document. Nonetheless, the establishment of two regional forums and three multinational shipping lines clearly indicate the willingness of Latin American and Caribbean countries to collaborate in matters related to ocean-liner transport. For instance, the West Indies Shipping Corporation (WISCO) was established in 1961 by 12 Caribbean countries and presently operates four cellular vessels which are largely devoted to the requirements of owner countries -three in short-sea services between the Caribbean islands and the US East Coast, and the other on a Caribbean inter-island route.

The majority of merchant fleets of this region were established on the basis of the continued supremacy of two important pillars, i.e., cargo reservation regimes and the liner conference system. The impact of market, service, technological and legal forces on the liner conference structure was treated at parts II.A., and II.B., and IV.A.1.b) above; the results of those same forces on cargo reservation regimes will now be dealt with in this part.

The fundamental question here is not whether cargo reservation regimes have assisted in the establishment and operation of such fleets, as they most certainly have, but whether the present structure of such regimes is appropriate in the light of changes which have taken place and are occurring in the industry.

It will be recalled that most cargo reservation regimes were prepared and adopted in the years between the end of the Second World War and the start of the container revolution, and reflect the era of general cargo vessels and labour-intensive port operations. Since that time the characteristics of ocean-liner transport have ineluctably changed. For example, Latin American and Caribbean fleets have changed to multi-purpose and cellular vessels which permit the carriage of a wide range of cargoes as well as containers. Not only have the characteristics of such fleets changed but also there has also been a shift from modal to intermodal and multimodal transport systems and the ocean-liner industry has entered an age of "system optimization", chronic overtonnaging, scale-economy services, contract carriage of homogeneous cargoes and interchangeable transport services.

1. The impact of market and service forces on cargo reservation regimes. In Latin American and Caribbean trades the spin-off or separation of containers from ocean-liner transport and their carriage under contract arrangements will depend on the volume and balance of containers in movement, and the frequency of service required by shippers and consignees. Currently, these factors weigh heavily against a separation of containers from ocean-liner transport services. Nonetheless, the trade flows of this region have only begun to be containerized, and as this process advances the basis for such separation should be created. For example, it has been estimated that by the end of this century the amount of cargoes carried in containers for Latin American and Caribbean countries will increase by 31 per cent. As both international trade and liner transport are dynamic and permanently evolving fields, a spin-off of containers in high-volume Latin American and Caribbean trades could occur within the next decade. Thus, it would appear that sufficient time exists for the present transport equipment to be amortized and for appropriate plans to be made to participate in the remaining liner services as well as in the contract carriage arrangements for containers.

With reference to the plans for future participation in liner and contractual carriage arrangements, it is most important to consider what impact such separation might have on the cargo base to which reservation regimes are applicable. It might be thought that after the spin-off of containers in a specific trade route they will be treated as any other bulk cargo, but this probably will not be the case. Even after containers are spun-off from ocean-liner services, they will retain many of the characteristics of liner cargoes --such as the continuity of flows and frequency requirements of shippers and consignees. These common characteristics will probably preclude their treatment as either liner or bulk cargoes. As containers transported under contractual arrangements would have characteristics of both liner and bulk trades, their spin-off might lead to a reclassification of cargoes subject to cargo reservation regimes. Such reclassification might involve a change from the traditional bulk and liner categories to bulk, liner and those which are carried under contractual arrangements in liner trades, or quasi-liner cargoes. Thus, the current structure of cargo reservation regimes for bulk and liner cargoes might be



restrictive if a separation occurs, and in the future efforts might be made to determine if a third category is needed for quasi-liner cargoes.

As containers will share both bulk and liner cargo characteristics, liner operators of this region could be caught in a vicious circle, because in order to engage in the contract carriage of containers a sufficient volume and balance is needed to meet cargo owners' frequency requirements. Without such volume and balance containers must be transported on traditional liner vessels, which after the spin-off will be much more expensive than their contractual counterparts. The higher cost of liner carriage for containers could reduce the volume even further and increase cargo owners' efforts to utilize contractual arrangements for the carriage of their containers. To break this vicious circle, Latin American and Caribbean countries with similar trade patterns might combine their individual cargo bases.

The efforts of cargo owners to utilize contractual arrangements for the carriage of containers might take many forms. For example, they could begin with attempts to lower transport costs through the use of contract carriers in trans-Atlantic and trans-Pacific trades, while liner operators from this region would act as long-distance feeders between Latin American ports and those of North America. The second step might be the formation of large international consortia in which the liner companies of this region would have either active (operational) or passive (shareholding) minority roles. Finally, as minority participants in international consortia, the countries of the region would face the risk of having a merchant fleet which might lack the flexibility to respond to national interests.

2. The impact of service and technology forces on cargo reservation regimes. It might be considered that the availability of financing is the fundamental factor which limits the incorporation of new technologies such as reduced-crew cellular vessels and 48' (14.63m) containers into Latin American and Caribbean fleets. While funding is important, the acquisition of new technologies by ocean-liner companies of the region fundamentally depends upon the types and volumes of cargoes in movement, the locations of cargo origins and destinations, the need for a smooth interface with other systems and the evolution of trade flows. Currently, the availability of financing weighs against the incorporation of such technologies, but the wide range of liner cargoes -- containers, refrigerated goods, odd-sized units, automobiles, steel, etc. -- presented for transport and the relatively small volumes limit the possibility for intensive use of specialized vessels and equipment. If the amount of cargo carried in containers increases 31 per cent, as was indicated in part IV.C.1., a base might be created for the utilization of such technologies. However, the inland technology requirements for Europe and North America are not only different but also in early stages of evolution, as already noted in part III.C.2., and each must be studied carefully to ensure that the technology selected can have a long-term harmonious interface in those regions as well as in Latin America.

In addition to financing, cargo and interface problems, the major impact on cargo reservation regimes might come from shippers and consignees of this region who recognize the benefits of a systems approach to the distribution chain through intermodalism, harmonized inland transport services, load centering, new technologies, facilitation of trade documentation and procedures, etc., that is provided by liner operators from industrialized countries who participate in Latin American and Caribbean trades. This could

result in strong efforts by shippers and consignees of the region to limit the scope of application of cargo reservation regimes to traditional bulk and non-homogeneous, non-containerizable liner cargoes, thereby permitting quasi-liner cargoes to be transported by contract carriers. With the possible spin-off or separation of containers from liner shipping and the attendant lowering of rates through contract carriage arrangements, shippers and consignees might allege the loss of market shares through what are viewed as excessive transport costs.

3. The impact of legal forces on cargo reservation regimes. Although this fact is not generally recognized, ocean-liner transport is an industry of shared sovereignty: that is to say, the ocean transport of goods between two or more countries requires compliance with the legal regimes of each. Liner operators seek to comply with the laws of each country they serve, but at times there are differences between the requirements of such laws. For example, a bilateral trade agreement between two countries, which permits only the vessels of those nations to participate, might be at variance with the laws of another country whose vessels seek access to that trade. This variance is academic unless the latter country is a principal trading partner of the other two and can take retaliatory measures such as changing to other sources for the same goods or closing its ports to their vessels. Thus, an understanding of the relation between national ocean-liner regimes is of fundamental importance to shipping lines and, as a result, must be given careful and continuous study.

Of all the legal measures that are currently being applied to or elaborated for the ocean-liner industry, possibly those which might have the greatest impact on the Latin American and Caribbean countries are related to the initiatives of the EEC and US, as well as their common efforts at the US/CSG meetings and at the GATT. While each of these initiatives was discussed individually earlier in this document at parts IV.A.1., IV.A.2., IV.A.5., and IV.B.3., it is important to consider their possible impact on the cargo reservation regimes of the Latin American and Caribbean countries. An assessment of the exact impact of such initiatives is impossible, as each case will be determined by differing criteria of the relevant national authorities, but certain scenarios can be suggested. First, section 13(b)(5) of the Shipping Act of 1984 and 19 of the Merchant Marine Act of 1920 clearly permit the FMC to bring actions against cargo reservation regimes. However, no such actions will be brought in the case of the former unless a US flag vessel is commercially able to enter the trade in question, while the latter will not be utilized unless a shipping line is denied the right to participate on an equal basis in the desired trade.

The second scenario involves a backing away from the written law, pursuant to the role the US Government sees for maritime transport in its overall commercial, economic and defence policy. As was discussed at part IV.A.1. a) above, section 13(b)(6) of the Shipping Act of 1984 makes the application of 13(b)(5) subject to Presidential review. Moreover, the importance of shipping within that overall policy must be understood. An indication of the different roles maritime transport should play within such policy can be seen from the US initiative to liberalize international trade in services by including all services within the GATT framework, while at the same time denying the liberalization of shipping services within Note 1 to Annex A of CLIO. This conflict in the US position on liberalization of shipping services leads one to believe that shipping is accorded a secondary

parties. The inherent flexibility of measures, practices and customs would permit contracting parties to adopt proposals at the "custom" level to verify their usefulness. Once verified, the custom might be proposed for upgrading to a recommended practice or sent back to the technical level for further study. If proposed measures, practices and customs are approved by, for instance, two-thirds of the contracting parties present and voting, they could be incorporated into the convention at their respective levels. Likewise, a similar procedure can be utilized for their removal.

#### B. A new organizational structure for ocean-liner companies

Commonly ocean-liner transport is defined by its physical elements such as vessels, containers, fork-lift trucks, gantry cranes, ports and many others. Everyone is aware of these elements and the activities carried out by each, but it is seldom recognized that such activities make liner transport a repetition industry: that is to say, day-in and day-out the same cargoes are loaded and discharged, the same vessels enter and depart the same ports, the same trade and transport documentation is prepared, the same Customs formalities are complied with, etc. This repetition might lead one to believe that the physical elements and daily activities define the totality of ocean-liner transport, but nothing could be further from the truth. While important, the physical elements and repetitive activities are merely a small part of the industry.

Upon critical examination, it can be seen that liner transport is much more than physical elements and operational activities. To see beyond these aspects it is necessary to separate the repetition and direction functions of shipping enterprises. There are many elements in common, but the first function largely involves the daily operational activities, while the second requires an ongoing evaluation of the market, service, technological and legal forces which create an environment of constant change and permanent evolution for the industry. To see behind the everyday mask of repetitive activities, one must look beyond the reactive or operational atmosphere of today and towards those elements which will assist in carrying out the policy and planning requirements of tomorrow. The stimulus of change which results from such forward-looking evaluation should not be underestimated, as it can permit ship operators to develop an in-depth understanding or strategic vision of the industry and anticipate as well as utilize the future.

Liner companies of this region might wish to consider the advantages of modifying their organizational structures to reflect the above differences. Certain liner companies of other regions have created the positions of Chief Operating Officer (COO) to carry out the repetition aspects and Chief Executive Officer (CEO) for the direction aspects of shipping management. While the former is in charge of the daily, cost-effective operations of the line, the latter considers alternative routes for vessel deployment, new technologies, sources of competition, possible joint operating arrangements, new legal regimes and the permanent evolution of the industry. To ensure an effective integration of both the repetition and direction functions, the COO usually reports to the CEO, who is also President of the company.

### C. The change from traditional liner operators to trade route specialists

Traditional liner operators are experts in moving cargo between ports. When the costs of moving goods between ports is compared with that between origin and destination, however, it can be seen that the largest amount of revenue comes from shoreside activities. For example, Cast North America operates a two port system between Montreal and Antwerp, with an integrated inland transport system, and estimates that only 10 per cent of its costs are involved in ocean carriage. Similarly, SLS indicates that ocean transport costs are approximately 25-30 per cent of the total, while Atlantic Container Line considers they reach 30 per cent. Thus, between 70-90 per cent of all income from activities in the distribution chain is generated from inland transport, cargo handling, storage and other related services, and liner operators of this region might wish to consider the advantages of becoming trade route specialists (TRS).

A TRS utilizes a systems approach to the entire distribution chain and seeks to harmonize all activities in the movement of goods from origin to destination. During such movements TRSs either act as or form joint ventures to provide whatever services are needed, whether they might be ocean carriage, terminal operation, land transport, storage, packing, Customs clearance, maintenance of inventories, invoicing, etc. While the success of traditional operators is largely based on time and place utility, economies of scale and price, TRSs enjoy wider parameters which range from shipper and consignee involvement in the design of vessels and in the selection of route structures to purchasing and inventory control advisory services for cargo owners. The purchase of a vessel or cargo handling equipment by a traditional operator is an investment in transport, whereas a similar purchase by a TRS is an investment in the productive processes of a trade route. The demand for the services of traditional operators is largely determined by the terms of trade (FOB or CIF) and other requirements, while for TRSs these aspects become less relevant as goods are carried under contract from producers to consumers.

TRSs are not simply ocean carriers selling space in their cargo holds. They seek to identify and develop non-vessel services for cargo owners which might enhance and stabilize their earnings. TRSs realize that ocean-liner activities cannot be carried out as they were prior to intermodalism and are restructuring their enterprises accordingly. The TRS works with cargo owners to design distribution systems which are linked together with computers and communications technology.

### D. A common liner policy for Latin American and Caribbean countries

Survival of liner operators requires knowledge, skills and understandings above and beyond the technicalities of vessel operations. The major challenge facing Latin American and Caribbean countries in this time of structural change is related to the establishment of a common policy for co-ordinating their independent ocean-liner activities. As was set forth in part IV above, the three principal elements of a liner shipping policy are the commercial, economic security and national defence aspects. Almost all Latin American and Caribbean countries have similar requirements in each of these areas, and this similarity permits them to consider the elaboration of a common liner shipping policy.

Joint action by shipping lines of this region, whether to establish multinational companies or consortia, rationalize operations or execute slot-chartering arrangements, should allow them to achieve an appropriate scale of operations, offer modern technologies, maintain frequencies required by cargo owners, pool technical and operational experience and have a wider financial base, all of which would contribute directly to more cost-effective services. A study carried out by Hapag-Lloyd suggests that vessel capacity utilization on the North Atlantic could rise from 68 to 85 per cent if services were co-ordinated, and that this would lead to a cost savings of over 20 per cent. Hapag-Lloyd began implementing the results of this study when it and Atlantic Container Line rationalized their services on two routes between Europe and North America. This rationalization eliminated four vessels, permits the sharing of equipment, stevedore facilities and inland transport equipment and, it is hoped, will save millions of dollars for both lines. Similarly, the co-operation between Barber Blue Sea and ScanCarriers has resulted in an overall improvement of US\$ 30 million in the two companies' operating results. Thus, shipping lines can enjoy economies of scale not only through the acquisition of large-scale vessels, which was presented in part II.D., but also through economies of co-operation.

1. Operational aspects of a common liner policy. At present almost all countries of this region seek to satisfy their ocean-liner transport needs independently. While there are certain differences in national economic goals which are adduced to justify such independent operations, the long-term shipping crisis has made it necessary to join with other lines in order to rationalize services. As an example of the change in operating policies by shipping lines from other regions, a spokesman for Hapag-Lloyd recently indicated that no European line is big enough to go it alone in the prevailing market conditions.

With the establishment of RTW services by USL and EL, many carriers of this region began to consider the risk of becoming feeder lines for those operators. While this risk might appear to be lessened with the bankruptcy of USL, such is not the case. In effect, that risk should be considered in the broader context of the forces which are restructuring the ocean-liner industry. Whether in respect of RTW or traditional liner services, the real risk facing liner operators is related to the establishment of intermodal distribution systems in which they do not participate. Such systems view ocean-liner transport as merely one activity in the movement of goods from origin to destination. Shipping lines which are part of an intermodal distribution system will most likely have greater access to cargoes, probably leaving for non-system operators only cargoes in low-volume, seasonal and unbalanced trades.

In 1985 approximately 60 per cent of the exports and imports by value of this region were destined to or came from Europe, Japan and North America. This concentration of trade should provide an appropriate basis for the establishment of distribution systems on those routes. For example, trans-Atlantic and trans-Pacific liner operators from other regions who seek to enhance load factors could make arrangements with cargo owners, land carriers, shipping companies which provide services between ports in North America and those of this region, and others in order to establish origin-to-destination distribution systems. In November 1986 the major intermodal operator APL began offering such a service from Australia to the

Indian Subcontinent and the Arabian Gulf. In this operation cargoes are to be carried between Australia and Singapore by the ANRO consortium (composed of Australian National Line, Djakarta Lloyd, Neptune Orient Lines, Nedlloyd and Australia Straits Container Line) for transshipment to APL vessels. As ocean-liner transport of the future will be carried out in the context of distribution systems, liner operators of this region should carefully evaluate common policies which might lead to the establishment of their own systems.

In the light of the need for liner operators to rationalize their operations with other similarly situated companies, Latin American and Caribbean countries might wish to consider the elaboration of a common liner policy which could include co-ordination of the independent operating patterns of their fleets through (a) three subregional consortia - West Coast of South America, East Coast of South America, and Mexico, Central America and Panama, (b) use of Panama's centre-port concept to facilitate container movements between consortia, (c) use of rail and road intermodalism in Asia, Europe and North America to reduce the number of ports of call, (d) expansion of West Indies Shipping Corporation (WISCO) services to include the broader Caribbean basin, and (e) a systems or intermodal approach to items (a) through (d) so that, for instance, WISCO might deliver cargo to the East Coast consortia at a Caribbean transshipment centre for onward carriage to Europe, and vice versa.

As an example of how the above elements of a global policy would operate, the subregional consortium on the East Coast of South America would provide transport services between each participating country and North America and would accept containers from and deliver them to the West Coast consortium at an appropriate Caribbean transshipment centre for on-carriage to and from North and South America, as well as to and from European destinations. The containers of the West Coast consortium could be carried between Panama and the Caribbean transshipment centre by the West Indies Shipping Corporation. If this option were found not to be cost-effective, containers might be exchanged between consortia by ocean-feeder services operating between Valparaíso, Chile, and Buenos Aires, Argentina. Obviously, any of the existing east/west South American land routes is a third option but, as was brought out in part II.C, there are numerous topographical obstacles. Thus, just as the East Coast consortium would provide regional access to the East Coast of North America and Europe, the West Coast consortium would provide similar access to the West Coast of North America and Asia.

If there is not sufficient cargo to commercially justify continuing the north/south services on to Asia or Europe from North America, the consortia could act as cross-traders and participate in the commerce which moves between those regions, as permitted by section 19 of the US Merchant Marine Act of 1920. The benefits of acting as a cross-trader should not be underestimated as, for instance, *Empresas Líneas Marítimas Argentinas* and *Transportación Marítima de México* have earned a appreciable part of their annual revenues in trans-Atlantic trades between Europe and the US and in trans-Pacific trades between Asia and the US, respectively. Other elements of this global shipping policy would include the use of intermodal transport systems in Asia, Europe and North America, and slot chartering where cargo volumes do not permit the use of vessels between ports-of-call and final destinations.

2. Institutional aspects of a common liner policy. The structural changes now occurring in ocean-liner transport have created a pressing need to evaluate the role accorded cargo reservation regimes by Latin American and Caribbean countries. In addition to the institutional aspects of a common liner policy presented in part IV., countries of the region might also consider what modifications to reservation regimes would reflect the ocean-liner transport environment of the future and, at the same time, avoid the effects of measures permitted by the common shipping policy of the EEC and the US Shipping Act of 1984. Other matters which might be analyzed include the separation of homogeneous cargoes from liner transport, the interchangeable nature of the latter, the need to use intermodal systems, the growing use of load-centre ports and feeder transport services, the control of overtonnaging, and the formation of regional liner consortia and joint ventures in related areas.

