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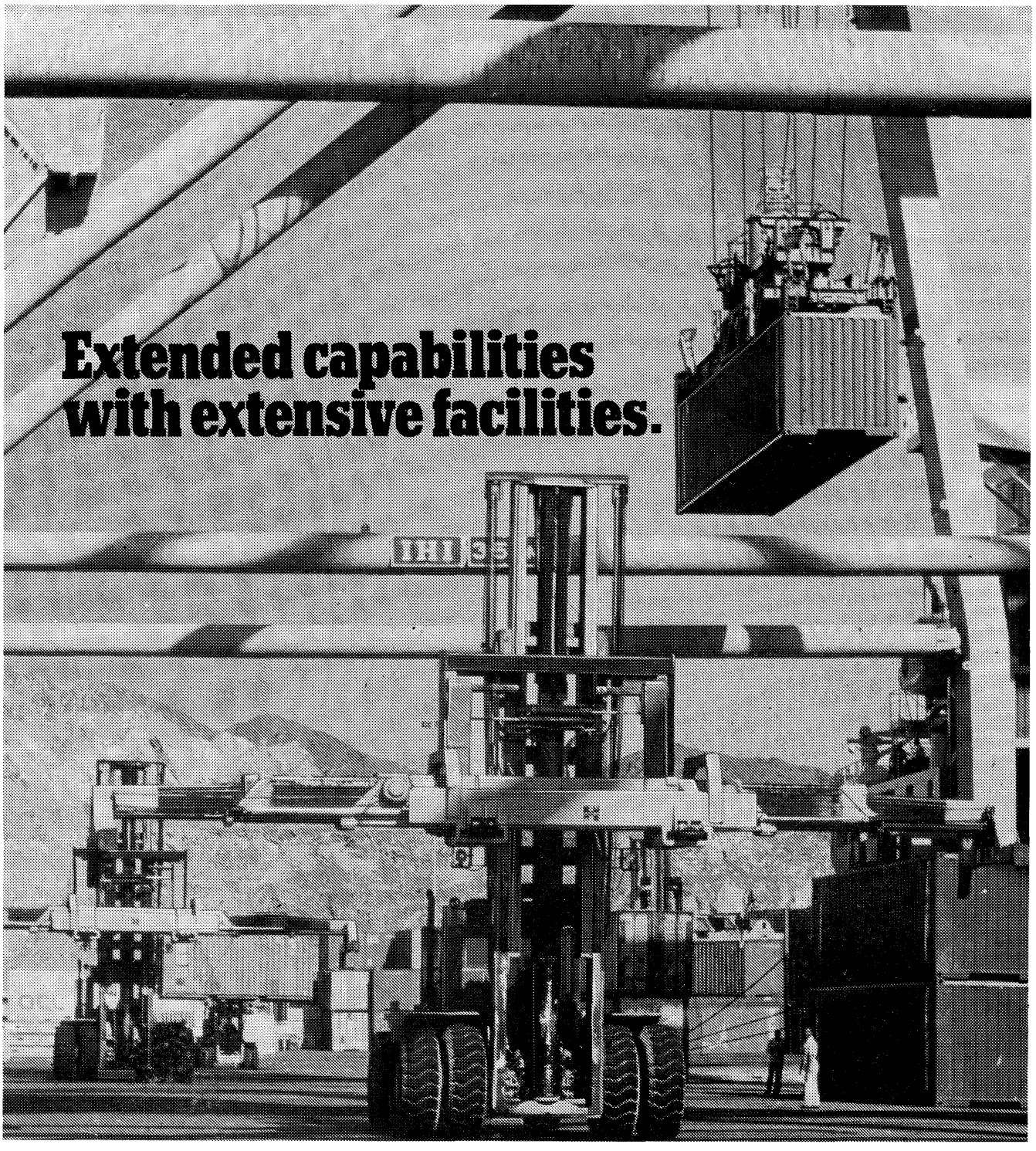
PORTS and HARBORS

May, 1986 Vol.31, No.5

Port of New Orleans

The Publisher: The International Association of Ports and Harbors

Kotohira-Kaikan Bldg., 2-8, Toranomon 1-chome, Minato-ku,
Tokyo 105, Japan



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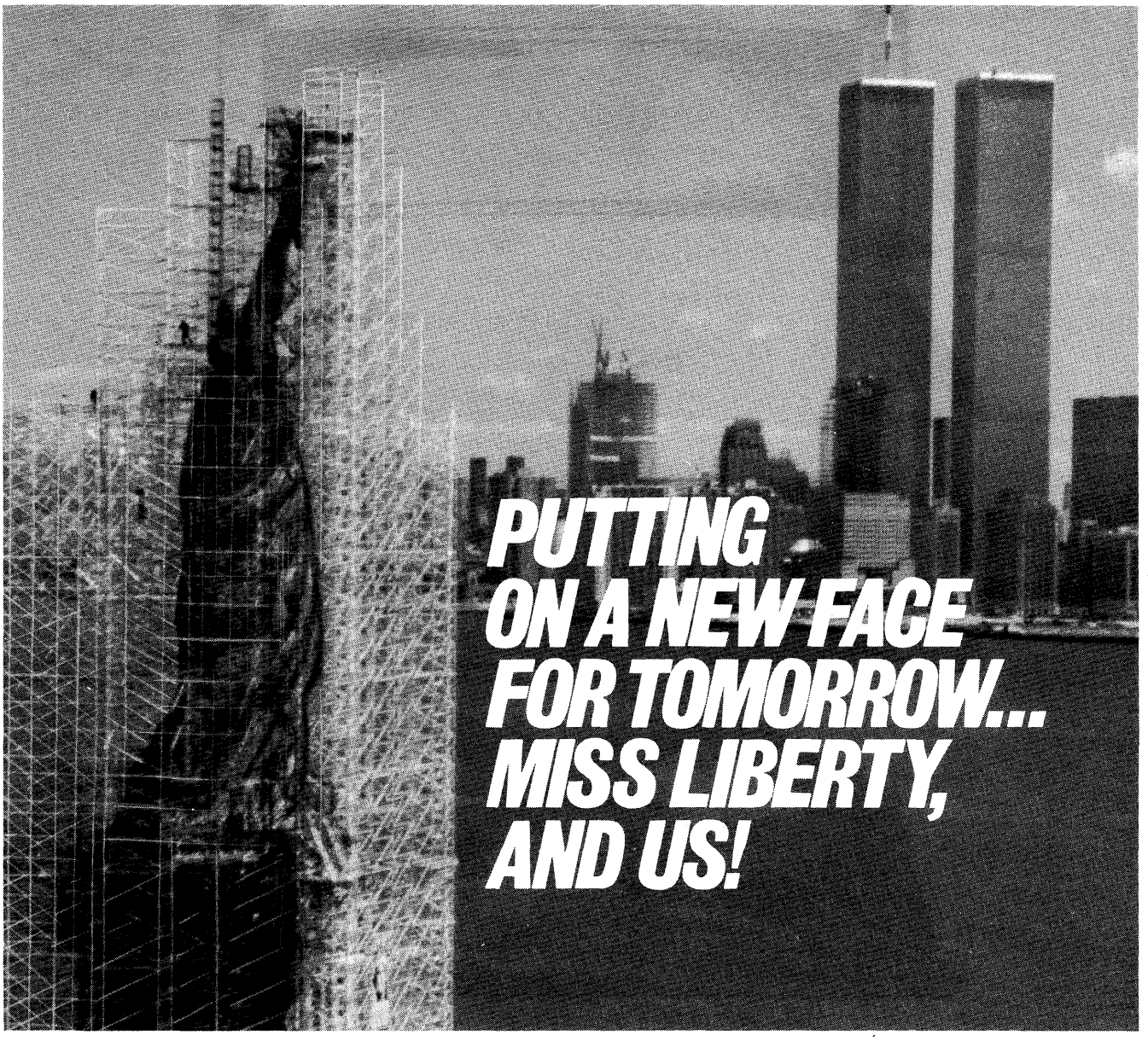

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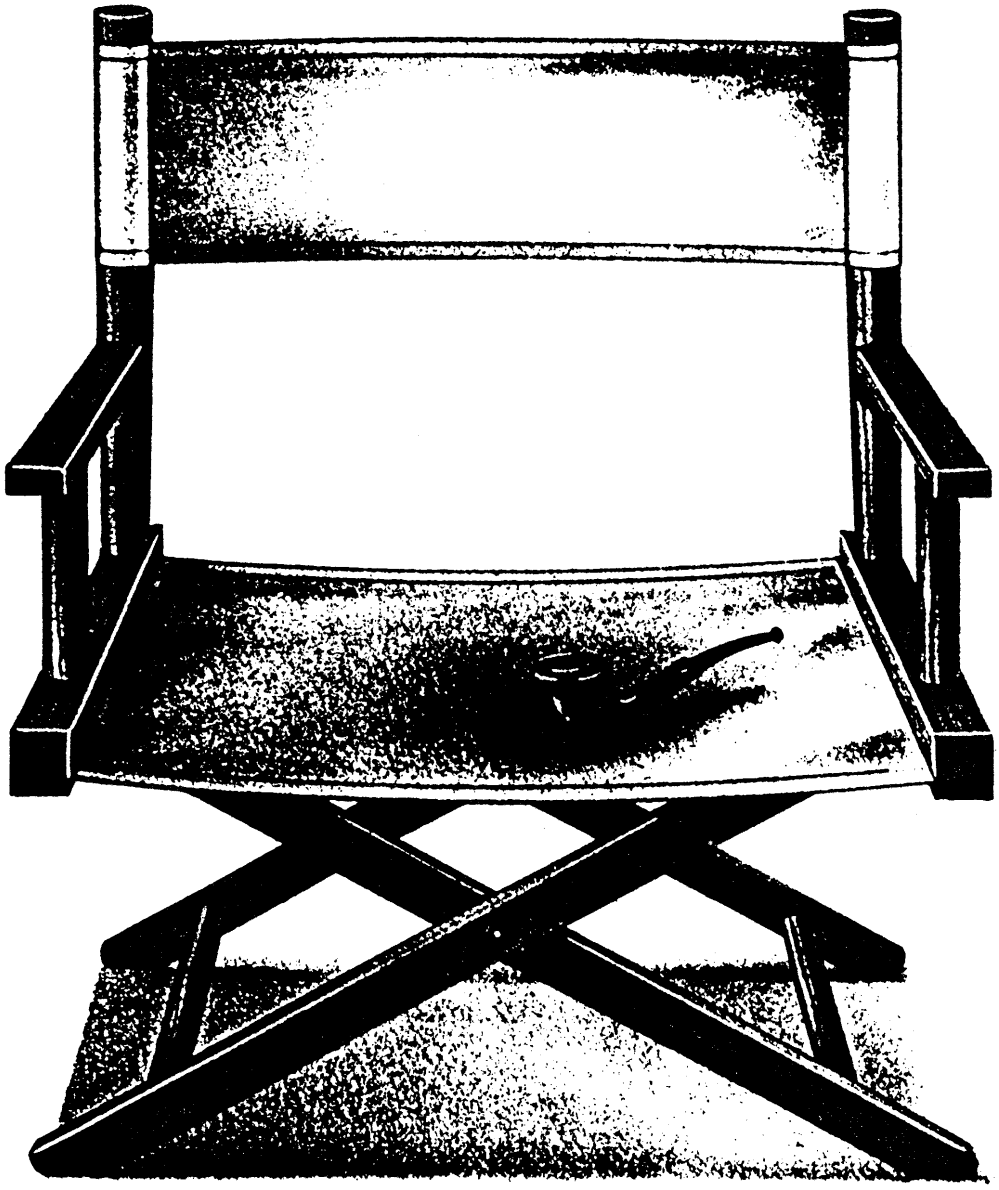

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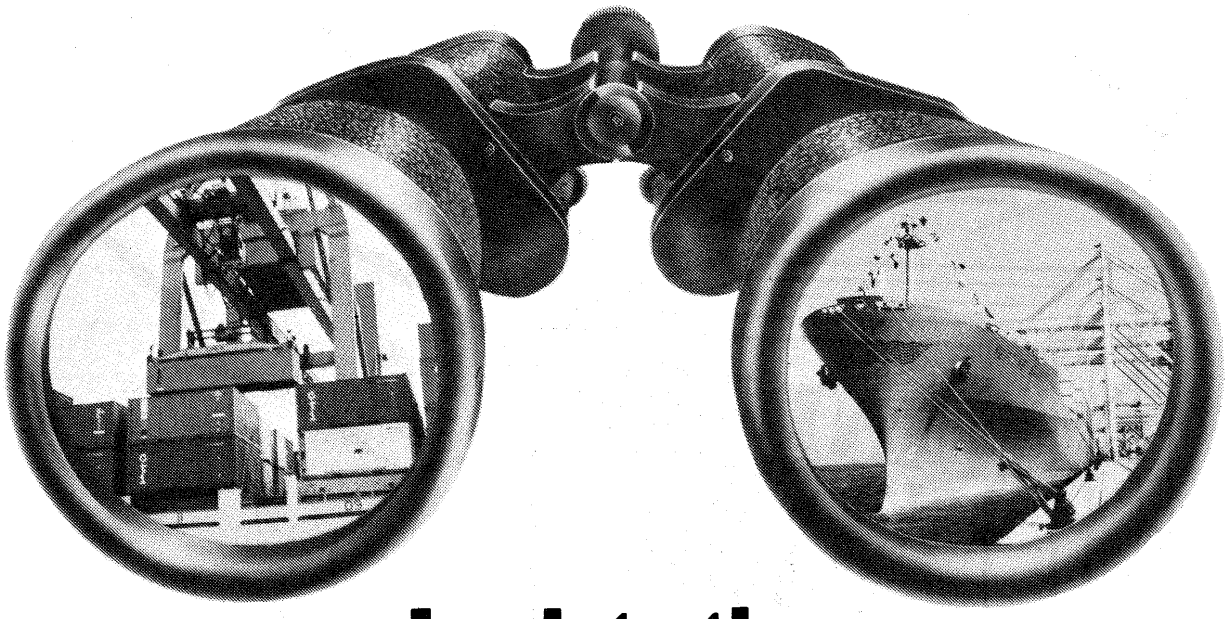

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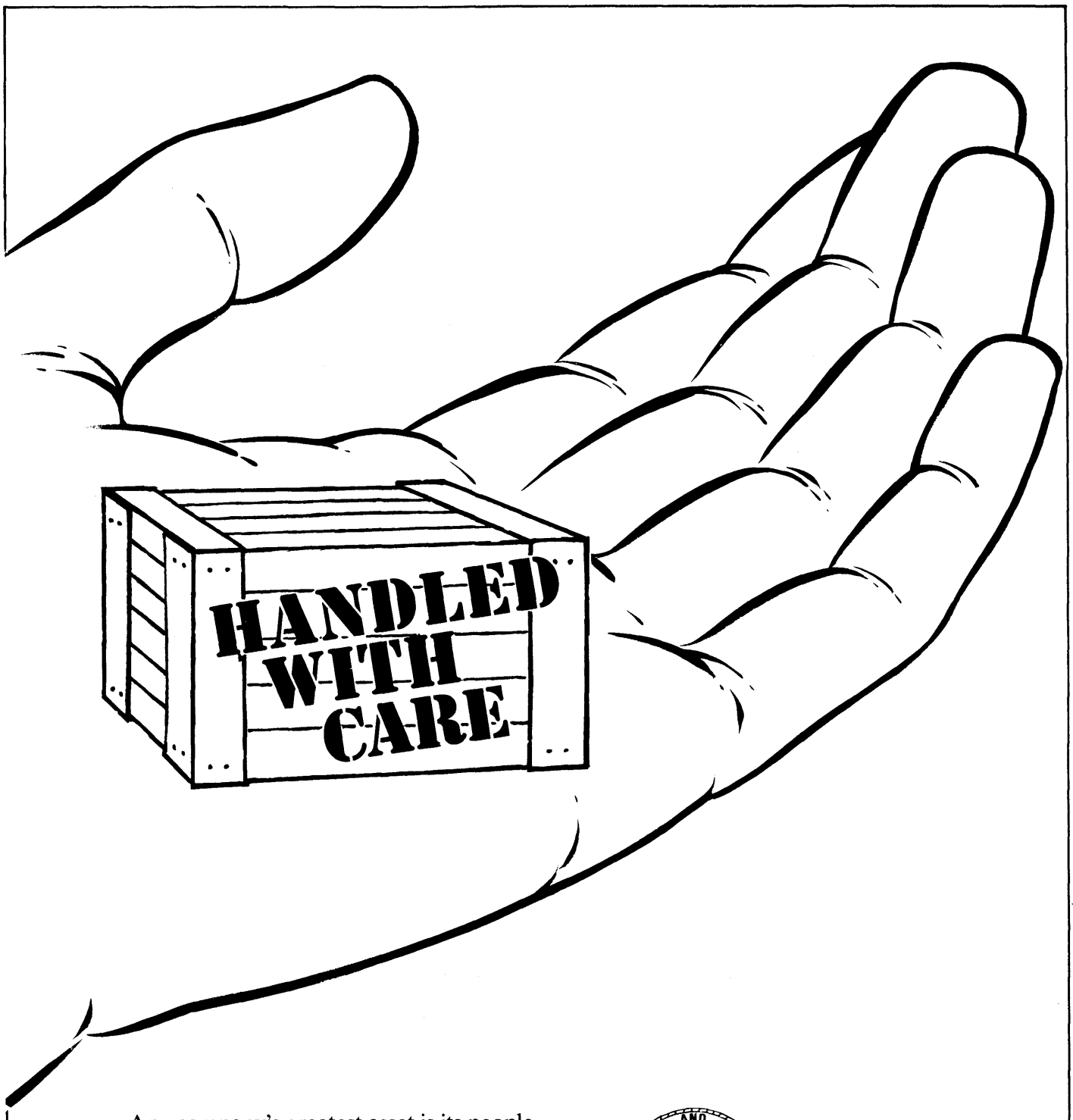

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PORTS and HARBORS

Published by

The International Association of Ports and Harbors

N.G.O Consultative Status, United Nations (ECOSOC, UNCTAD, IMO)

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The Cover: Port of New Orleans (Harmony 7th Street Wharf development)
(Photo courtesy Sam R. Sutton)

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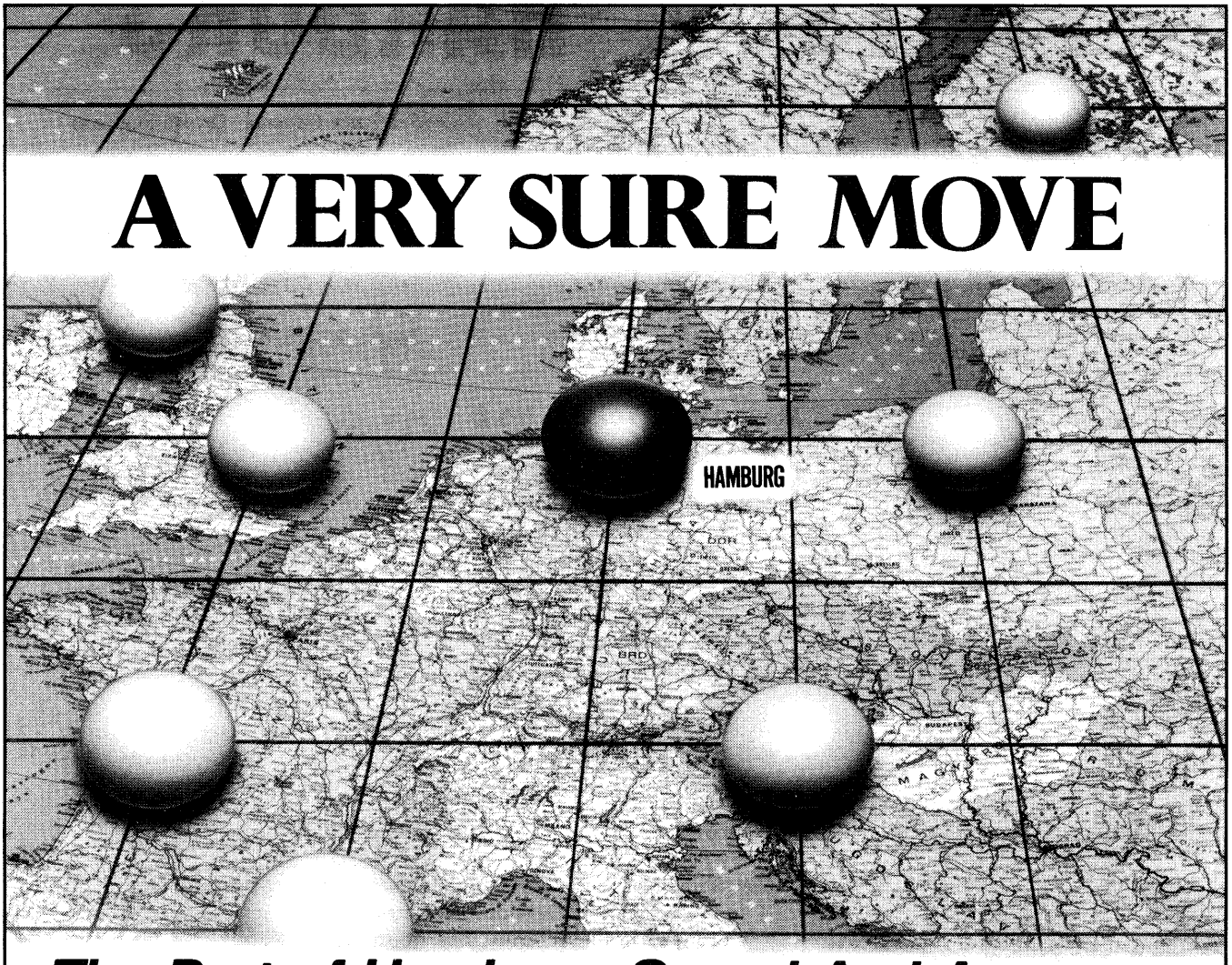

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IAPH announcements and news

A series of the Guide to Korea starts

Mr. Jong Soon Lee, Executive Managing Director, SEPRECO (Seoul Conference Preparation Committee), the Korea Maritime Port Administration, which is the host for the forthcoming conference of IAPH in 1987, has recently sent the Head Office an article introducing Korea. This is the first of a series planned for inclusion in "Ports and Harbors". According to Mr. Lee, following the first offering, which appears in this issue (on page 9), our host plans to run a series on Korea according to the following schedule:

1. Introduction to Korea (May)
   Location, Climate, Population, Language, History, Industry, Economy, Trade, Ports, etc.
2. Aspects of Korean Culture (June)
   Traditional Sports, Music, Dance, Calligraphy, Ceramics, Architecture, etc.
3. Picturesque Seoul (July–August)
   History, Development of Han River, Venue of 1988 Olympic Games, Distribution Plan, Palaces, Tourist sites, etc.
4. Tourist Attraction of Korea (September)
   Cheju Island, Kyungju, Korean Folk Village, Sorak Mt., etc.

Special Port Development Technical Assistance Fund: Contribution Report

Background

The Bursary Scheme which IAPH has made available to personnel in developing ports for training programs is financed by the Special Port Technical Assistance Fund ("Special Fund"), which in turn exists thanks to voluntary contributions previously made by the Association's members and the IAPH Foundation.

Since the introduction of the Scheme in 1976, the bursary has been awared to some 40 port staff from developing countries, enabling the beneficiaries to participate in training courses and seminars conducted at various places. As a result, this fund is now severely depleted.

In view of this situation, the Association at the Hamburg Conference decided to replenish its Special Fund to the effect of at least US$70,000 which will be sufficient for the training of 20 people for the term until the next Conference, by means of asking IAPH members to contribute to it. Resolutions No. 2 and No. 4 were passed to this effect.

In accordance with the Hamburg resolutions, the Secretary General sent a letter on June 5, 1985 to all IAPH members soliciting their contributions to the Fund.

Progress of the campaign

As of March 31, 1986, the amount received in contributions and that pledged in the ten months from the start of the campaign has totaled US$43,806. The list of contributors and the sums received or pledged are shown in the box.

The Hamburg resolutions stipulated that if the voluntary contributions did not amount to $70,000 by January 31, 1986, special dues would be assessed to the extent necessary to cover the difference between the total of the voluntary contributions received and $70,000.

After the Auckland Exco meeting scheduled for the second week of April, 1986, where the policy for assessment of the necessary amount in "special dues" will be determined, the Secretary General's request for special dues will be addressed to all members other than those who have made voluntary contributions.

Contributions to the Special Fund
(As of March 31, 1986)

Contributors	Amount
Paid:	(US$)
Port of London:	750
Port of Copenhagen:	350
Port Services Corp., Oman:	500
Associated British Ports:	3,000
Port of Houston:	1,000
Kelang Port:	200
Port of Halifax:	750
Port Alberni Harbour Commission:	200
Cyprus Ports Authority:	500
Belfast Harbour Commissioners:	300
Fraser River Harbour Commission:	300
Port of Tacoma:	1,000
Port of Amsterdam:	1,000
Port of Rotterdam:	3,000
Pacific Consultants International, Japan:	630
Ports Corporation, Jordan:	1,000
Clyde Port:	1,000
The Harbours Association of New Zealand and 9 Harbours:	2,000
Mr. Susumu Maeda, Japan:	20
Mr. Toru Akiyama, Japan:	500
The Japan Warehousing Association Inc.:	250
Yokohama Port Terminal Corp.:	500
Tokyo Port Terminal Corporation:	500
Nagoya Container Berth Co.:	500
Shimizu Construction Co., Ltd., Japan:	250
Port of New York and New Jersey:	1,000
Ports & Shipping Organization, Ministry of Roads & Transportation, Iran:	1,000
Nakagawa Corrosion Protecting Co., Ltd., Japan:	250
Port of Hamburg:	3,086
Niigata Prefecture, Japan:	250
Toyama Prefecture, Japan:	250
Rinkai Construction Co., Ltd., Japan:	250
Pledged:	
Directorate-General of Shipping and Maritime Affairs, Netherlands:	720
Ghana Ports Authority:	500
Osaka Prefecture, Japan:	500

Port Experts wanted by ILO

The International Labour Office (ILO) has recently sent the IAPH Head Office a circular concerning the ILO's Technical Cooperation Programme in the ports sector. As indicated in the ILO circular, which is reproduced on page 11 of this issue, any persons in IAPH who might be interested in working for the ILO as experts on short- or medium-term assignments are encouraged to send detailed curriculm vitae to the ILO in Geneva. Such applications will be considered if and when any vacancy may occur in the ILO. The full address of the organization is given at the end of the announcement.

WTC Japan holds a memorial service for the late Gaku Matsumoto

On March 21, 1986, a memorial service was held at the Gokokuji Temple in Tokyo for the late Mr. Gaku Matsumoto, a founding father of IAPH and the initiator of the World Trade Center International, who passed away 12 years ago at 86. The World Trade Center Club of Japan jointly with several other organizations including IAPH, for which Mr. Matsumoto served as a top official until his death in 1974, held the memorial service for the great leader and philanthropist who gave the birth to these two worldwide associations.

The event was attended by some 100 people including those who used to work under him, as well as his old friends and relatives. The date falls on the Spring Equinox Day, on which Buddhists in Japan pay a visit to their ancestors' graves. Thus the participants first went to Mr. Matsumoto's tomb and were then driven to the WTC's clubroom in the WTC building in the Hamamatsucho area for a reception.

From IAPH, on behalf of the Secretary General, Deputy Secretary General Kusaka and other Head Office staff attended the gathering.

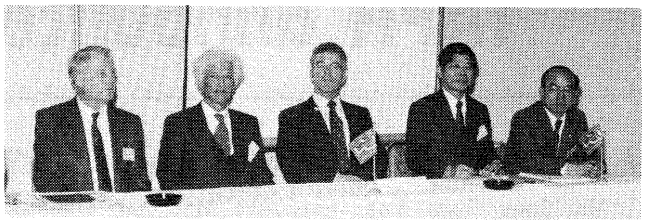
Visitors

On March 13, 1986, Prof. Ir. J. de Koning, Professor of Technology of Soil Movement, Mechanical Engineering Department, Delft University of Technology, Ir. Tj. Visser, Director of the Oosterschelde Storm Barrier Project, Ministry of Transport and Public Works, and Mr. D.J. Vroege, Director of Dosbouw (a consortium of six major Dutch contractors engaged in the Delta Plan), visited the head office and were received by Dr. Hajime Sato and his staff.

The three engineers were visiting Japan to give lectures on the Delta Plan (reported in the journal in its December 83 and April 84 issues) to Japanese civil engineers at the invitation of the Coastal Development Technology Institute, Tokyo, Japan.

Lectures were given on March 14 in Tokyo and heard by nearly two hundred civil engineers of varied expertise. A civil engineer commented after the lecture that the presentations were most interesting and of great value, reflecting as they did the expertise and experience accumulated over such a large-scale engineering project in their academic, governmental and work execution aspects were so interesting and of great value.

The party visited the Port of Osaka on March 17, the Port of Kobe on March 18 and the Port & Harbour Research Institute of the Ministry of Transport at Kurihama on March 19. At each place, the visitors engaged in a lively exchange of views and comments with the resident civil engineers.



L to R: Ir. Tj. Visser, Prof. Ir. J. de Koning, Mr. D.J. Vroege, Mr. Teruju Matsumoto and Mr. Shingo Fujino

The lectures attracted some 200 people.

On March 13, 1986, Mr. P.P. Rajendran, Executive Engineer, Container Terminal, Cochin Port Trust, and Mr. P. Prabakaran, Electrical Engineer, Madras Port Trust, visited the head office and were received by Mr. R. Kondoh. They exchanged views and comments on the current situations concerning container transport in Japan.

On March 19, 1986, Mr. Francis E. Phillips, Deputy Editor of "Containerisation International", visited the head office and was received by Mr. R.Kondoh. He was visiting Japan to view the current situations of industries involved in container transport, including container terminals. He visited the ports of Tokyo, Yokohama, Nagoya and Kobe.

On March 19, 1986, Ms. Mieke Stubbe, Marketing Consultant, Nederlands Congress Bureau, and Mr. Barend W.M. Michels, Coordinator, Convention Market, KLM, visited the head office and were received by Mr. R. Kondoh.

Membership Notes

Changes

Port Alberni Harbour Commission (Canada)

Commission Member:	Mr. J.A. Robertson
Commission Secretary:	Ms. Linda Kelsall
Property Manager:	Mr. D.G. Andow

The Korea Tug Owners Association (Korea)

Address:	Rm 806, Yale Bldg. 60 Choongshin-Dong, Chongro-Ku, Seoul
Chairman:	Mr. H.Y. Chung

Korea Dredging Corporation (Korea)

Address:	Daeha Bldg., 10th F. 14-11, Youido-Dong, Youngdungpo-Ku, Seoul
Telex Number:	HYCON K26442, 23585
Office Phone:	(783) 5091 – 6, 5191 – 5
Facsimile Number:	(783) 5091 – 6

GUIDE TO KOREA – Part I
IAPH Seoul Conference Preparation Committee

Introduction to Korea

Korea, the last Far Eastern country to be opened to contact with the West late in the 19th century, has become a popular international tourist destination. In addition, she achieved splendid economic growth during the 1960's and 70's for a nation once badly scarred by the Korean War. People all over the world call it the "Miracle of Han River", comparing it with the "Miracle of Rhein River" in West Germany. In the light of this growing national power, the Korean people have been awarded the honor of being host to the '86 Asian Games and the '88 Olympic Games. "Seoul to the World, the World to Seoul" – this is the motto everybody has in mind these days.

Korea is a peninsula which is located to the southeast of the Asian mainland. It borders China and the Soviet Union to the north, and faces Japan to the southeast across the East Sea. Roughly equivalent in size to the United Kingdom, the Korean peninsula is approximately 600 miles long, and 135 miles wide at its narrowest point. The peninsula has been divided since 1945 into two zones, Communist North Korea and the Republic of Korea.

Climate

The climate of Korea is temperate, with the year divided into four distinct seasons. July and August are the rainy and the hottest time of the year, while December and January bring snow and the coldest weather. Spring and Autumn are the favorite seasons in Korea, with many cherry blossoms in April and May, and russet browns in October and November.

Population

The total population of the Republic of Korea is about 41 million. It is thought that the peninsula was first settled by nomadic tribesman from central and northern Asia. Through the ages the Korean people have developed their own language, a simple alphabet, a hearty cuisine, and unique culture and art forms.

History and language

Korea consisted of three rival kingdoms from early historic times to the 6th century A.D., at which time the Kingdom of Shilla unified the peninsula. The succeeding Koryo dynasty lasted from the 10th to the 14th century. The last royal family, called Yi, ruled for 5 centuries. The Yi dynasty was responsible for many accomplishments, including the development of Hangul, a phonetic form of the written language. After going through all the trials of Japanese colonization for 36 years and the Korean War of 1950-1953, Korea has succeeded in propelling itself along the path to modernization, industrialization, and economic and military independence.

Industry

Because Korea is poorly endowed in natural resources, trade is its lifeline. Korea has thus been given top priority to export expansion so that it can pay for the raw materials and capital goods needed to sustain economic growth. Exports rose form US$55 million in 1962 to US$30.3 billion in 1985 in terms of current market prices, recording a nominal average annual growth rate of 36.7 percent. In more recent years, however, the growth rate has slowed to around 20 percent, owing partly to the worldwide recession and partly to the transition from the earlier period of rapid export increases achieved from a very low base. Imports increased from US$422 million in 1962 to US$31.1 billion in 1985. In 1963, imports were 5.7 times larger than exports, but in 1985 imports exceeded exports, though by only 10 percent. The country's trade gap has also been drastically reduced over the past two decades or so.

Expansion of the volume of trade has resulted from the development of key industries. Recently, rapidly developing heavy and chemical industries have come to account for over half of the total manufacturing output. In 1981, Korea became the 13th largest steel producer in the world with the completion of the project to increase the annual production capacity of the Pohang Iron and Steel Company facility from 5.5 million metric tons to 8.5 million tons. Furthermore, the fast-expanding shipbuilding industry in 1985 exported US$5 billion worth of vessels, enabling Korea to become the second largest ship exporter in the world. The country is also developing the production of a wide range of industrial machinery and equipment. The electronics, textile and automotive industries are major growth sectors and increasingly important foreign exchange earners as well.

Assembly line in a motor plant

Korean cars lined up for loading

Economy

So, Korea today is ranked as a newly-industrialized country with the potential to join the ranks of the developed economies in the not so distant future. This has been due largely to the successful implementation of a series of five-year economic development plans launched in 1962. A new Five-Year Plan is geared for a second take-off, to propel Korea into the ranks of economically-advanced nations during the 1980's. The 5th Five-Year Economic and Social Development Plan (1982 – 1986) projects the real GNP to grow at an average rate of 7.6 percent. At this rate of growth, the GNP in terms of 1980 prices will reach US$90 billion by 1986, with the per capita GNP exceeding US$2,000. Exports should increase at an annual rate of a little over 20 percent, reaching US$53 billion in 1986.

In view of Korea's past economic performance, it is generally predicted that the new five-year plan will be carried out successfully, especially since the country now puts even greater emphasis on technological advancement, better product quality and higher productivity.

Trade

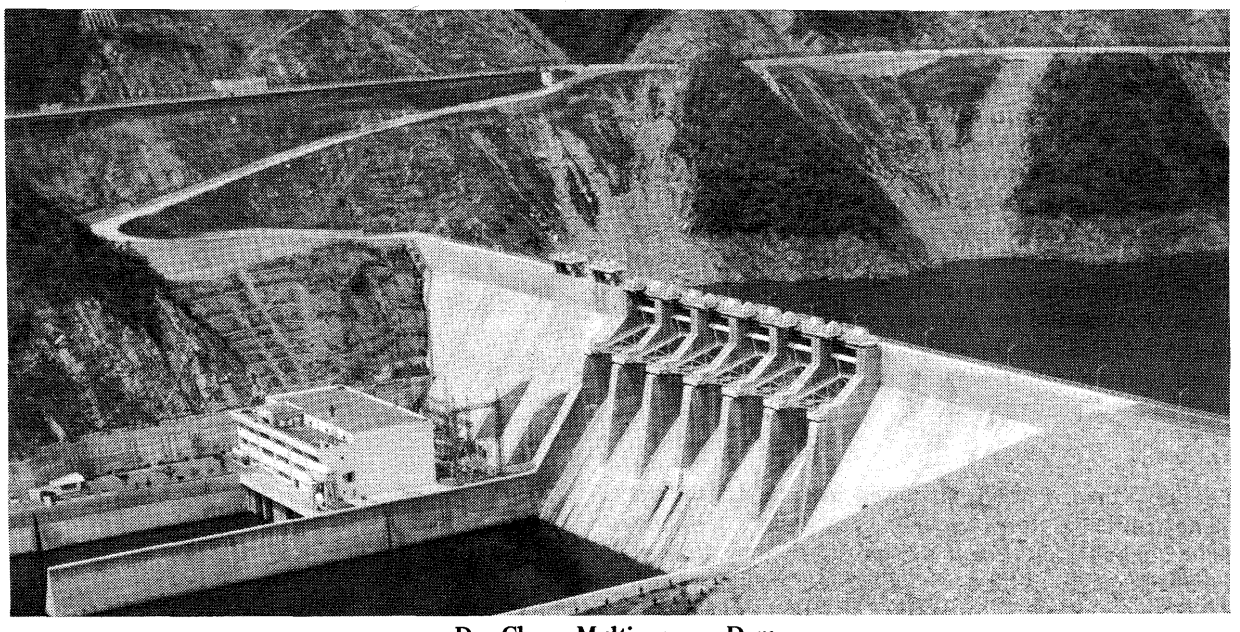
With the nation's foreign trade expanding, the requirement for stable and timely transportation of cargo has made the shipping industry an essential part of the economic performance of the country. The government, which had come to recognize this important role, formulated the Consolidated Shipping and Shipping Promotion Plan, under which KMPA was established in March, 1976 as a central government agency to implement the plan. This government measure brought rapid growth to the Korean merchant fleet, from a mere 113,000 grt in 1961 to 7.3 million grt in 1984. Moreover, the policy has fostered the development of Ports as well.

Ports

Korea has 24 ports called Open Ports that have been designated by the government as open to foreign ships.

The No. 1 port in Korea is Pusan Port. Owing to Pusan's location as the site of a port, Pusan Port opened as early as 1876 and has been developed into the largest, most modern international port in Korea. In 1984, the port processed a total of 36 million tons of cargo, which represented 23 percent of the nation's import/export cargo volume. Pusan Port has an accommodation capacity of 56 ships, ranging from 10,000 to 50,000 dwt. It has 7 piers at present with a berthing capacity of up to 50,000 dwt ships with 8 gantry cranes installed, each of which is capable of lifting 40 tons. To cope with the increasing cargo traffic through the ports, additional container terminals are slated for construction and an auxiliary port is to be built at Kamchon, north of Pusan, by 1988.

Incheon Port, 40 kilometers away from Seoul, has been serving as the gateway to the capital ever since it was opened as an international harbor in 1883. The Port, the 2nd largest in Korea, has a berthing capacity of 32 ships, ranging between 2,000 and 50,000 dwt. In 1984 the Port handled a total of 30 million tons. To allow ships to enjoy uninterrupted entry and departure against tidal differences, the Port has a large dock basin with two huge dock gates, one for up to 10,000 dwt ships and the other for 50,000 dwt ships. By 1988, when the current development plan is carried out, Incheon Port will have a berthing capacity of 35 ships.



Dae Chung Multipurpose Dam

ILO technical assistance in the port sector

1. The programme of the ILO in the port sector focused on continuing improvements in the working and living condition of port workers, and gives special attention to such questions as manpower, planning, recruitment, decasualisation, vocational training and certificates of competency, occupational safety and health, labour problems owing to technological change and modernisation, labour legislation and administration, labour-management co-operation and worker's welfare.
2. The ILO's activities take such forms as the provision of expert advice and assistance, fellowships, seminars and training courses, and the exchange of technical information. As regards the services of international experts or teams of experts in developing countries, the ILO requires qualified experts for assignments on a continuing basis. During the coming years, it is expected that projects will relate particularly to port operation, including vocational training of port workers and occupational safety and health. Experts will be required to carry out assignments which may include one or more of the following:

(i) **Organization of work in ports**

Experts advise port authorities on the organization of cargo handling, in particular regarding labour standards, incentives and cargo-handling methods with the object of raising the productivity of dock labour and streamlining cargo-handling operations. Assistance is also given in the organization of sheds and warehouses, and in examining possibilities for rationalization and increased work mechanisation.

(ii) **Training of port personnel**

In this field, experts normally advise and assist port authorities in the training of port personnel at all levels and assess the training needs of all categories of personnel, including management, administrative and accounting personnel; supervisors; foremen; tally clerks; operators of mechanical equipment; and ordinary dockworkers. They identify the training facilities required, draft syllabi of training courses, and determine the duration for courses and the qualifications required for admission. Counterparts are trained to carry out the training activities organized.

(iii) **Training of dockworkers**

Experts assess the training requirements of all categories of dock personnel, including supervisory staff, with special attention being paid to the needs of operators of cargo-handling equipment and of the personnel in charge of its maintenance. Experts prepare syllabi for courses and determine the qualifications required for admission and the certificates issued to trainees.

(iv) **Training in maintenance of port equipment**

Experts assist port authorities in the training of personnel in charge of maintenance of port equipment. Organization of the work of all maintenance personnel for mechanical and electrical equipment, the preparation of course syllabi and the training of counterparts are among the normal tasks undertaken.

(v) **Regional advisory services in port operations**

Regional advisers in port operations advise governments or port authorities on all aspects of port operations and activities. They examine which fields require further assistance and give advice in connection with all aspects of port activities, with particular reference to those which are related to the use of the dock labour force. Special attention is given to the social consequences of the introduction of new methods of cargo handling in ports. Advisers also assess the training needs of port personnel in the countries visited, and advise the governments concerned regarding appropriate training facilities and activities.

(vi) **Dockworkers' labour legislation and conditions of employment**

Assignments in this field normally comprise the following activities: advising governments with reference to port recruitment, hiring, systems of payment, regularisation of employment and stabilisation of earnings, welfare facilities and training. Assignments also involve examining the best ways to improve conditions of employment of dock labour, giving due consideration to the social consequences of the introduction of new methods of cargo handling. Assistance also includes the drafting and implementation of labour legislation and regulations governing portworkers' conditions.

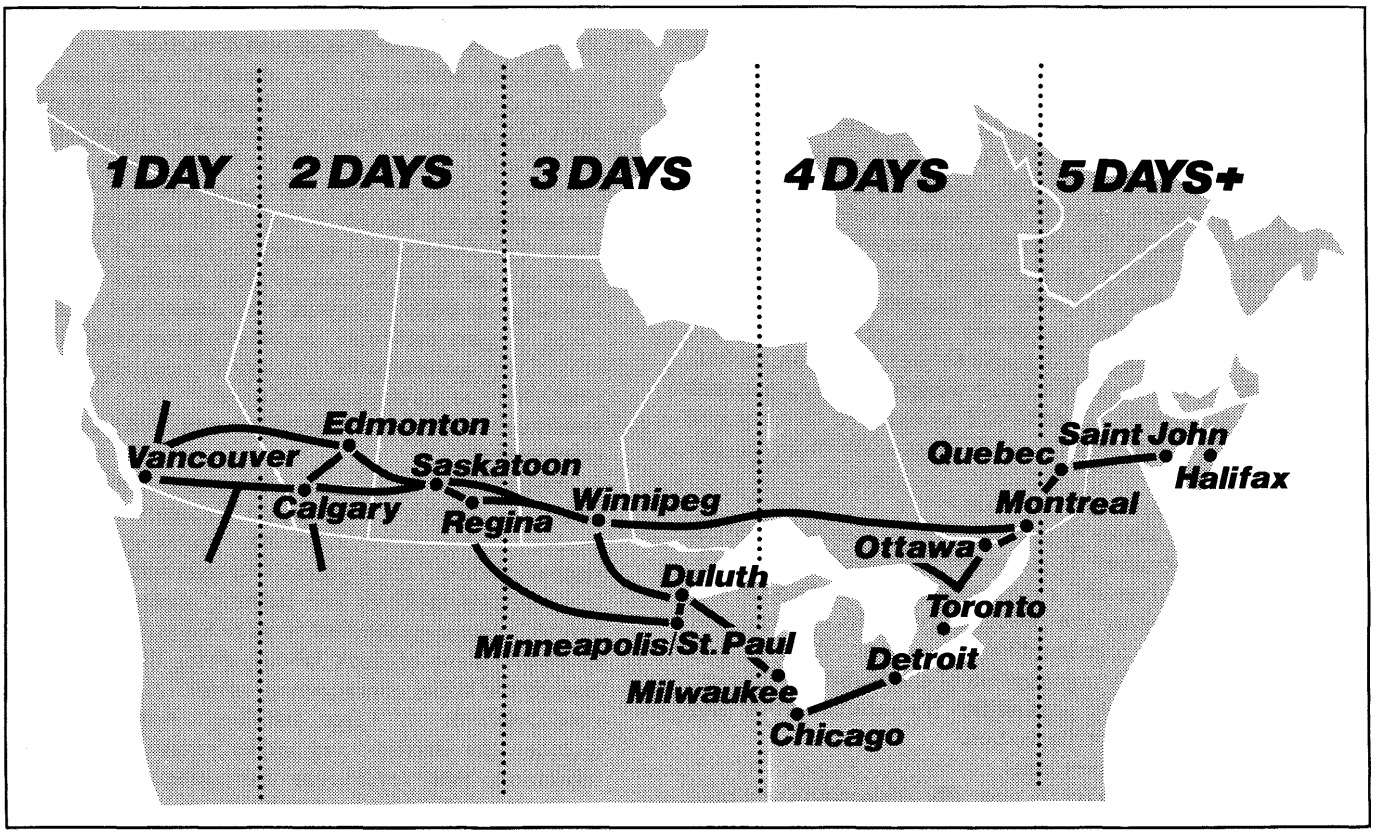
3. Experts may be recruited for assignments varying from one to thirty-six months. They should have long experience in port operations and first-hand practical experience of the particular speciality concerned. Experience of work in developing countries in projects of a similar nature is an advantage.
4. If you are interested in being considered for such assignments and would like to be informed of forthcoming vacancies in the field of ports as they occur, please send a detailed CV to:

Milja Stosic
Technical Co-opeartion Personnel Branch
Technical Co-operation Department
International Labour Office
CH-1211 Geneve 22, Switzerland
Telex: 22.271 BIT CH
Telephone direct: (022) 99
central: (022) 996111

Bursary recipient announced

Mr. C.B. Kruk, Chairman of the IAPH Committee on International Port Development (Port of Rotterdam) recently announced that he has approved an IAPH bursary for Mr. Evripidou Andreou Costas, Senior Technical Assistant, Cyprus Ports Authority, to attend the civil engineering and port management course to be organized by the Port of Singapore Authority from November 3 to 14, 1986.

Vancouver – Canada's West Coast Load Centre Port



Vancouver Port Corporation
1900 – 200 Granville St.
Vancouver, B.C. V6C 2P9
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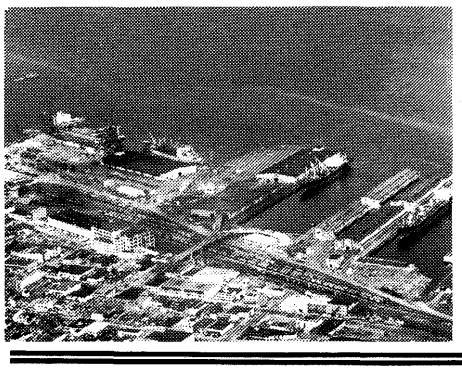
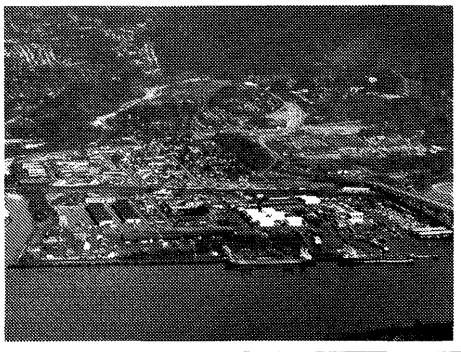
A focus for west coast shipping...

ATTEND PAN-PACIFIC SEMINAR III AND SEE EXPO '86

The Vancouver Port Corporation will host Pan-Pacific Seminar III, an international forum for port authorities, maritime, trade and transportation interests, at the Hyatt Regency Hotel, Vancouver, Canada, September 29–October 2, 1986.

The seminar will be co-sponsored by the ports of Yokohama and Oakland. It coincides with Expo '86, a world exposition on transportation and communications, to be held in Vancouver May 2–October 13.





Open forum:

State of the Art of Bulk Terminal Technology

By P. Soros
Soros Associates
Consulting Engineers

Economic Background

The prices of raw materials and ocean shipping have been severely depressed for some time. The cost of capital is at an historic high. Bulk terminals are capital intensive. Thus, the cost per ton cost of moving raw materials from land to water, or vice versa, accounts today for a larger share of the total delivered cost of raw materials than at any time in the last 30 years. Environmental requirements further accentuate this trend for increased port charges.

There are a variety of approaches to respond to this problem, regardless of the size of the facility involved.[1] Economies of scale is one of them. These large facilities are often the pioneers of technological advances that eventually find their way into general practice.

This paper is a brief overview, from the author's personal experience, of "state of the art" technology in today's high capacity bulk terminals.

Train and Truck Loading and Unloading

Bottom Dump Cars

The highest capacity single track installation is at Conneaut, Ohio. Three coal cars of up to 100 tons are unloaded simultaneously with 6 shakeouts. (Fig. 1) Design rate is 3,600 TPH. The building design silhouettes the top of the cars and the gates against a strip of light. A single operator, located at a distance so that all 3 cars are in his angle of vision, controls the entire operation, including the locomotive. This facility has consistently unloaded over 12 million tons per year, including thawing in the winter.[2]

The highest capacity multiple track operation is at Narvik, Norway, with an annual capacity of 35 million tons.[3] Four trains with different grades of iron ore can be emptied at the same time. (Fig. 2)

Rotary Dumping

The common practice is to use an indexer or barney for cycles of less than 200 seconds. The Cleancoal installation at Ghent, Kentucky has a 150 second cycle, using only a switch engine.[4] The empty cars bumped pass through an automatic retarder for accumulation in a gravity yard (Fig. 3).

The highest capacity (6,000 TPH) single rotary dumper, with a 60 second cycle, is at Conneaut, Ohio. (Fig. 4) This cycle was achieved by preaccelerating the car by a side arm pusher before impact by the barney.[2]

The highest overall capacity rotary dumping, at 16,000 TPH, is at Tubarao, Brazil, combining two tandem dumpers with indexers.[5]

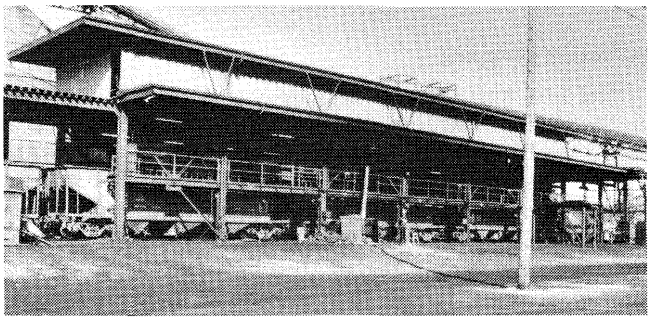


Fig. 1
Single operator controls locomotive and 6 shakeouts for 3 car unloading station.

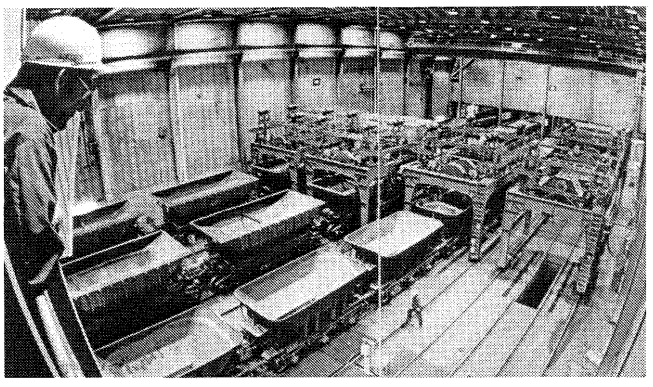


Fig. 2
Four trains with different grades of iron ore can be emptied at the same time.

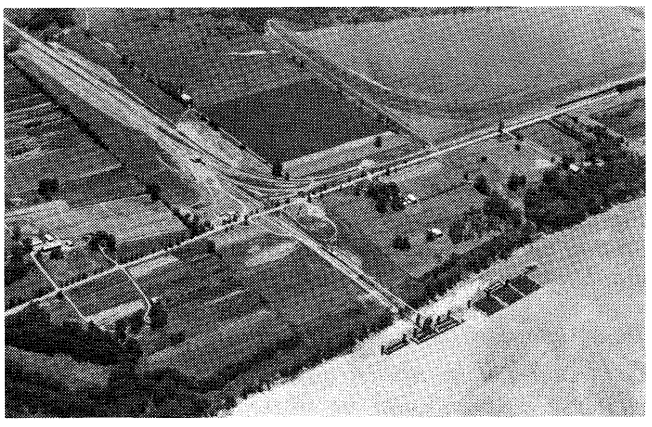


Fig. 3
150 second cycle is achieved with 1 switch engine and gravity yard controlled with automatic retarder.

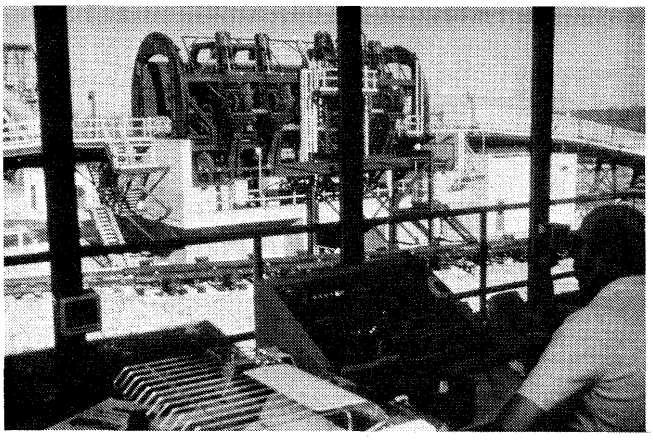


Fig. 4
Cars are preaccelerated for 6,000 TPH single rotary dumper

In Motion Dumping

The first high capacity installation was at Immingham, in the United Kingdom. Because of the small length and capacity of the British wagons, a relatively short pit with a single feed point at the bottom could be used.

Port Kembla in Australia was, for a short time, the highest capacity installation, at 4,400 TPH.[6] The pit and take-away system represents a breakthrough in reducing capital costs. Rather than provide an underground pit related to the capacity of a trainload, as in other Australian installations, the installation consists of a shallow 300 ton pit with six 500 to 1,600 TPH variable capacity vibrating feeders. The rate of the individual feeders is varied in response to the way the coal falls out of the passing train, with the combined feed rate limited to 4,400 TPH, the capacity of the conveyor system. (Fig. 5)

The same shallow pit concept is used at the recently completed Kooragang Coal Terminal, also in Australia. The unloading rate is 6,600 TPH.[7]

The problem of uneven build-up in the pit is dealt with by a single belt feeder with multiple slots. The feeder has a 1,000 HP drive and a 3.2 meter-wide belt, the widest in the world so far.

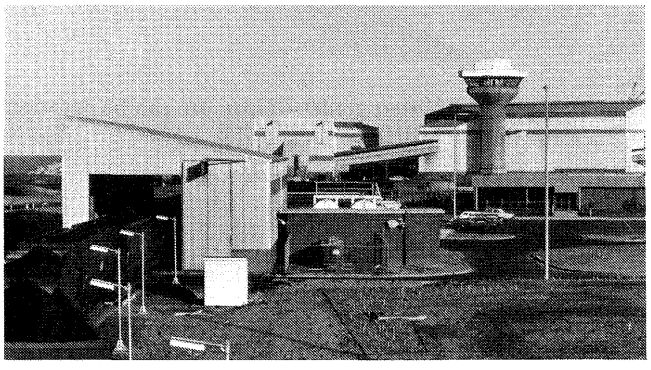


Fig. 5
Shallow pit with novel take-away system for 4,400 TPH in motion unloading.

Truck Unloading

At Port Kembla several million tons per year of coal in multiple grades must be received in daylight hours, for environmental reasons.

A three-lane highway loop over a compartmented slot storage allows trucks to dump directly into three 1,500 ton compartments. (Fig. 6) The compartments are emptied by 2 rotary plows at the rate of 4,000 TPH.

After dumping, the trucks are automatically washed, to prevent spilling coal dust on municipal roads. (Fig. 7)

Fig. 6
Highway loop with 3 lanes over a compartmented slot storage for multiple grades of coal.

Fig. 7
After dumping trucks are washed automatically, to prevent spillage on municipal roads.

Train Loading

The most sophisticated high capacity installation, accommodating multiple materials and random railroad cars, is at Conneaut, Ohio.[2]

The installation is capable of unloading coal and loading several grades of iron ore or limestone into the same train at the same time. Weights loaded into each car are kept within a tolerance of 1/10th of 1% and are distributed evenly over the axles within 2/10ths of 1%. (Fig. 8)

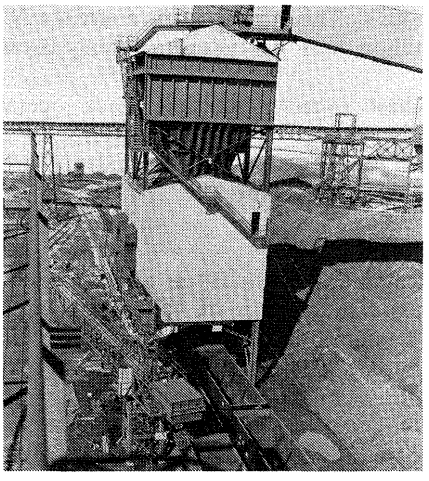


Fig. 8
Random railroad cars can be loaded with different materials, with weight tolerance of 1/10th of 1% and weight distribution over the axles within 2/10th of 1%.

Stockpiling and Reclaiming

Slave-stacking

The first slave-stacking system (a Soros patent) was used at Conneaut, Ohio with a capacity of 10,000 TPH. (Fig. 9) The slave-stacker created an additional pile without the investment in an additional conveyor travelling stacker.

The highest capacity stacking operation is at Tubarao, at 16,000 TPH.[9] This installation also incorporates two 16,000 TPH slave-stackers. (Fig. 10)

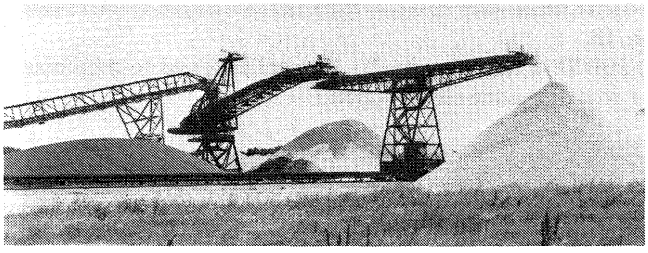


Fig. 9
10,000 TPH slave stacking creates third row of piles, saving additional yard conveyor and stacker.

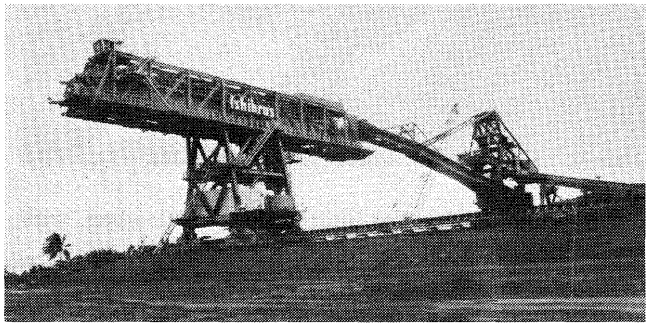


Fig. 10
16,000 TPH slave stacking at Tubarao, Brazil.

Dual Stacking

With small trainloads of different grades of material as in New South Wales in Australia, it may take longer to reposition the stacker than to unload a train. Thus, dual stacking at Port Kembla (Fig. 11) substantially increases the annual tonnage that can be put through a single railroad loop.

The same system is incorporated at Kooragang Island, designed for an ultimate annual capacity of 50 million tons.

Bucketwheel Reclaimers

These are the most cost-effective machines for high capacities, even though they have certain problems: fluctuation in output, tendency to structural collapse, main bearing failure and repair. For high annual production, the standard designs and design codes are less than adequate, in our view. Thus we developed special criteria, and most of the highest capacity installations in the last 15 years were built accordingly.[10]

The first 10,000 TPH bucketwheels were for iron ore at Tubarao. The 10,000 TPH machine at Narvik combines the same principles with an asymmetrical arrangement for better maintenance access. (Fig. 12).

Coal reclaimers have the largest volumetric capacity. For a short time the 6,600 TPH Port Kembla machines were the largest, now superceded by the 8,000 TPH machines at Kooragang. (Fig. 13)

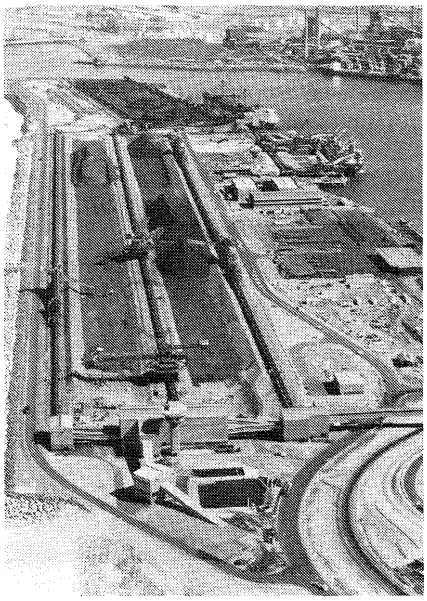


Fig. 11
Dual stackers reduce waiting time between trains.

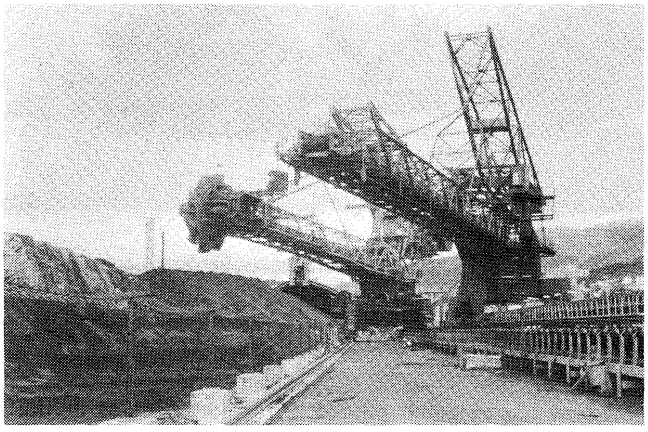


Fig. 12
10,000 TPH bucketwheel built to special criteria and for good maintenance access.

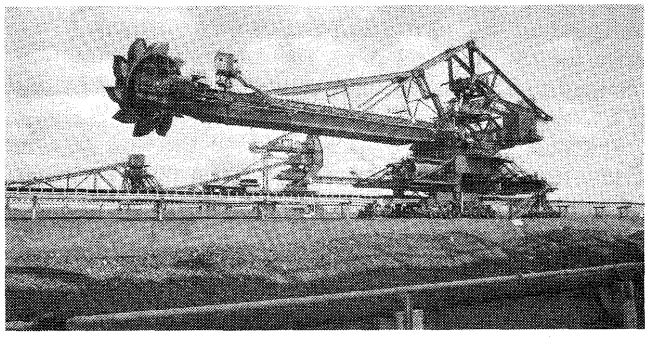


Fig. 13
8,000 TPH bucketwheel reclaimer for coal.

Ship Loading and Unloading

Ship Unloading

The highest capacity installation is at Conneaut, Ohio where two ships can be unloaded at the same time, at a combined rate of 20,000 TPH. (Fig. 14) One of these

berths has 5 grab unloaders, with a maintenance building immediately adjacent.

There has been great progress in extending the capacity of grabs, both in Rotterdam and in Japan and in the development of continuous unloaders of various types. The first open sea coal unloading terminal with continuous unloaders is at Hsin-ta, in Taiwan. (Fig. 15).

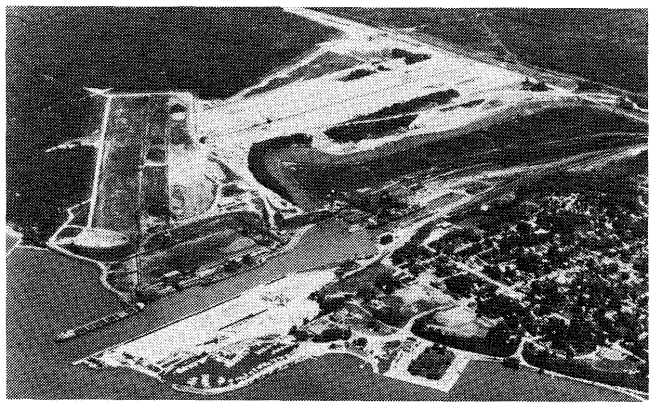


Fig. 14
20,000 TPH ship unloading installation.

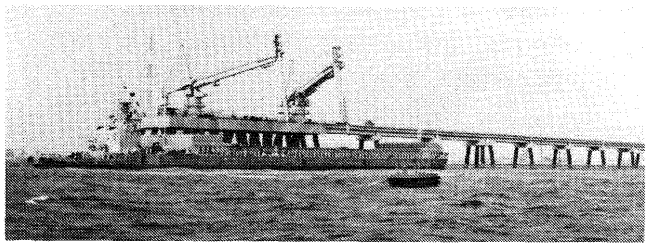


Fig. 15
Open sea coal pier with 2 continuous unloaders.

Shiploading

There are few areas in engineering where engineering know-how has as much impact on capital costs as in the combination of the mechanical systems of shiploaders and conveyors with marine piers.(11)

The largest capacity (10,500 TPH of coal) travelling loader is at Kooragang, Australia. (Fig. 16) The loader configuration was created to permit a very economic wharf design for 180,000 DWT ships. The deepwater construction is limited to a single rail support, with lateral forces braced back to shore.

The dual loaders at Port Kembla are the first capable of interruption-free loading, with a single dock conveyor and without a cumbersome reversible trailer. (Fig. 17)

The largest quadrant loaders are at Tubarao, Brazil. (Fig. 18) Each of these machines has 16,000 TPH capacity, with the lightest grade ore handled.

The largest linear loader (Soros patent) in operation is at Narvik for iron ore.(12) It has 11,000 TPH capacity and loads ships up to 250,000 DWT. (Fig. 19)

Two larger machines are currently under construction. The Cerrejon project in Colombia has a 10,000 TPH linear loader for loading 150,000 DWT ships with coal.(13) The Carajas project in Brazil(14) has a 16,000 TPH linear loader berth for 300,000 DWT ore carriers (Fig. 20), for an annual capacity of 35 million tons.

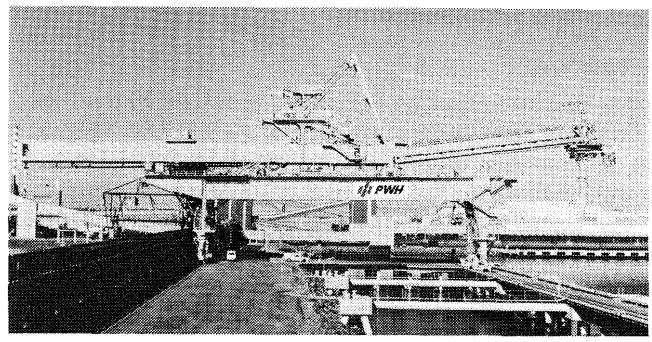


Fig. 16
10,500 TPH travelling loader for coal designed to minimize the cost of marine construction.

Fig. 17
Dual travelling loaders for interruption free loading, with a single dock conveyor.

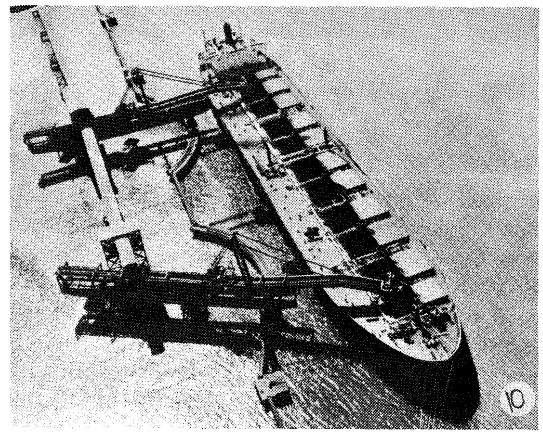


Fig. 18
280,000 DWT ore carrier loaded with two 16,000 TPH quadrant loaders.

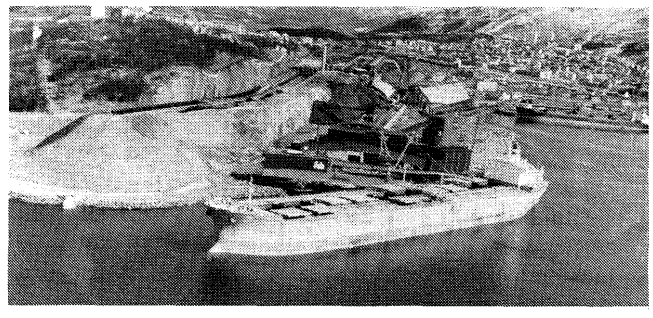


Fig. 19
250,000 DWT ship loaded with 11,000 TPH linear loader.

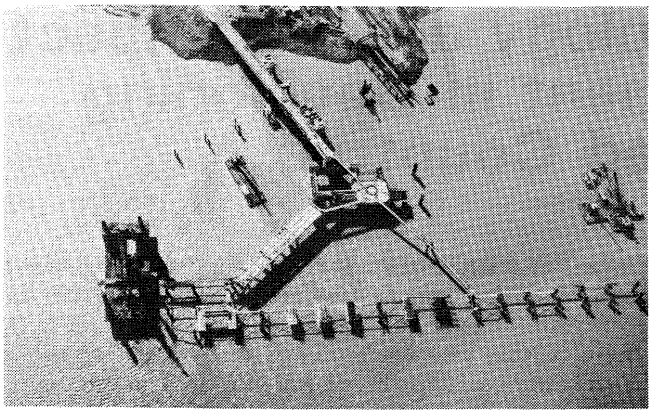


Fig. 20
16,000 TPH linear loader berth for 300,000 DWT ships under construction for annual capacity of 35 million tons.

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New Shipping Technology and Its Impact upon Port Development in Developing and Developed Countries

By Richard Y. Scheiner
Senior Port Engineer
The World Bank

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While evaluating the impact of new shipping technologies upon port development, one has to bear in mind that the impacts differ according to whether the port is located in a developed country or in a developing country. Furthermore, different types of vessels will create different impacts. Finally, any analysis will have to take into account political and social/human factors, which have a major influence in developing countries.

Ports have always been a major link in any country's trade; therefore, they play an essential part in a country's economic activities. Unfortunately, not all economic activities always lead to economic growth in the long term.

In the past, ports were defined as safe harbors for vessels and their main function was to serve as an effective collection and distribution point for cargoes carried by vessels. Modern trading concepts changed the function of ports into becoming one link in an integrated, intermodal transportation system, connecting ocean shipping to the various modes of inland transportation, including air. To adapt to their new role, ports and terminal operations have had to introduce new operational concepts in order to survive as financial and economic entities and to retain their position as a link in the intermodal chain.

Shipping Systems Development

The driving force behind the development of all modern cargo-handling and shipping systems lay in the need to escape from the slow rate of cargo handling and the high labor content of the conventional system and its inability to progress. The system eventually became associated with a rapid rise in stevedoring costs in developed countries. By 1950, ship costs in port plus cargo-handling costs accounted for some 80% of the through-systems costs on routes to the U.S. and were approaching 50% on many major European-based routes.

The development of modern shipping systems can be divided into epochs, as follows:

The period up to 1939: The development of early bulk systems.

1950 to 1965: (a) general unit load and semi-bulk development; (b) introduction of the cellular container system – chiefly in the U.S.

1965 to 1978: (a) the Container Revolution, characterized by a rapid takeover of the major routes between developed nations and an increase of some five times in ship TEU capacities to 2,000 TEU and the early development of integrated intermodal networks; (b) further development in semi-bulks (e.g., forest products, steel, chemicals, and vehicles); (c) early development of flexible systems in the form of large, main-line ro-ro and ro-ro/containerships that could carry containers in association with other cargoes.

1978 to 1985: (a) further technological evolution of container systems, particularly in terminals and in the development of intermodal networks; (b) the major development of flexible systems in the form of even larger ro-ro ships and semi-containerships to carry containers in association with semi-bulk cargoes, and the introduction of 5th generation container vessels (4,218 TEU); (c) the beginnings of container penetration into developing countries, including the transformation of routes to OPEC countries in the mid-1970's, followed by a rapid general growth toward the end of the decade.

The main issue is, naturally, "quo vadis" – Where are we going from here? Do we have reason to think that much of the technological revolution is now complete and that furture changes will be in the form of refinement in design and operating practices of shipping and cargo-handling systems only? Or will the next decades create entirely new shipping concepts and systems, forcing everybody into enormous new expenditures in order to survive? The introduction of new shipping concepts and cargo-handling systems will continue to be held back by the massive, worldwide capital investments in existing and yet-non-amortized port-facilities and shipping. Even attempts to develop larger units for cargo handling, like LASH (Lighter Aboard Ship) and the LUFF (Lifting Unit Frame) systems, are still meeting with limited success.

The history of the last three decades has shown that, usually, a fairly long process of gestation must elapse before new systems evolve to the point where they can make rapid inroads. While pointers to such changes are not evident at the moment, they might come in conjunction with a worldwide economic upswing. At present, the main trends are in the further evolution of inland transport networks, the development of new types of flexible ship (mainly the bulk/container-ship), and the refinement of existing types of vessels in order to render them more cost effective, and improved terminal operations.

Transformation of the Port

All these changes in maritime transport systems have inevitably resulted in the transformation of the port. Ports had to transform their large number of low-intensity general cargo berths into a limited number of high-throughput terminals, categorized as follows: (a) bulk, (b) specialized semi-bulk, (c) cellular container (deep-sea main-line services, feeder-line services), (d) container/ro-ro (full container handling by ro-ro methods), (e) cellular container associated with ro-ro for semi-bulks as well as containers (ro-ro, lo-lo), (f) modern semi-container, (g) ro-ro trailer for short-sea routes. All of these are characterized by

high-speed cargo handling, substantially reduced labor requirement per ton of throughput, and a reduced capital investment per ton of throughput in long-run terms. The pure container systems have been associated with sizable change-over investments in the ports although semi-container and ro-ro options were often very much less cost demanding.

We shall deal separately with bulk and containerization and then return to their common denominator. Much of what will be said about the one is valid for the other.

Containerization in Developing Countries

Containers were, for many years, regarded as unsuitable for developing countries. This was partly because of the real difficulties involved in containerizing, and the large size of investment required, and partly because the container system was perceived as being fundamentally capital intensive and, therefore, unsuitable for the developing world.

There are a number of reasons that this perception is now changing. First it has become clear that containerships provide more transport capacity per unit of capital than do conventional ships, and almost all general cargo ships now being built are of modern design and incorporate a substantial container capacity. In fact, when container penetration begins to approach 20% of the potential of a particular route, the capacity of conventional ships (which are not very efficient container carriers) is insufficient and full cellular vessels have to be introduced.

Developing countries have the one advantage that they are containerizing after a decade and a half of intensive technological development that has improved systems immensely and widened the range of options available. They are, however, faced with a number of problems, among the most important being the following:

- The difficulty in raising funds for port investment. This is particularly the case when ports are owned by the public sector, and the shipping lines and other private interests, which are the terminal operators, are often reluctant to invest money in infrastructure because of political conditions. Hence the importance of international finance organizations such as the World Bank.*
- Lack of tradition for planned maintenance, which is essential for the operation of complicated and high-cost container-handling equipment.
- Physical and administrative difficulties in the integration with inland modes of transport, leading to problems in the operation of integrated systems and container control.
- Problems in cargo balance and the movement of empty boxes.
- Customs and other bureaucratic delays, leading to potentially long inland container turnaround times and container dwell times in port.
- Social difficulties in dealing with a reduction in labor requirements in the ports, stemming from the introduction of containerization.

Even if many of these difficulties stay with us for some time, resulting in unsatisfactory intermediate systems, we think that the inherent logic of the modern container and its integral intermodal transport systems will prevail. Eventually customs and bureaucrats will understand that modern intermodal transport is the least-cost and most efficient solution even for developing countries.

Because of limited traffic, say 40,000–60,000 TEU/year, most ports in developing countries will operate more or less efficiently with simple equipment – FLT, tractor-trailers, and using ship's gear exclusively. Once container traffic begins to approach throughputs of 70,000–100,000 TEU per year, there may be need to move toward the established technologies for container terminals (i.e., shore cranes, transtainers, etc.). The decision on the timing becomes a major issue, especially in times of depressed economic activities such as prevail at present in most developing countries.

For main-line services, which will sustain the operation of ships of above 800 TEU, the gearless cellular system is an ideal solution. It is the cheapest form of ship; the space below the weather deck is well utilized by a cell guide system following the lines of the ship very closely; it has no cargo-handling gear; the hatch covers are the simple pontoon type.

Shipping routes to developing countries will require vessels to call at a multitude of ports – mainly because of the limited cargo to and from those ports. Since in most of these ports shore cranes are either unavailable or unreliable, vessels will have to provide ship-borne gear. Because of this, vessels will remain, for some time to come, in the 800 to 1,500 TEU range-thus permitting shipowners to use their smaller, handy sizes to sail to developing countries, while concentrating their technological-development efforts on the long, lucrative, and cost-effective runs.

Containerization in Developed Countries

Economic Developments and the Choice of Vessel Type and Container-Handling Technology

Technological choices are not simply a function of the port sector but are controlled by the configuration of the whole system as it affects ship choice and inland transport, as well as ship-shore transfer and port transit. Ship choice, which is perhaps the most important, is a direct result of the shipowner's reading of the economic development of a country and possibly an entire region and the resulting cargo flows, types of cargo moved, trading patterns, route length, and aspects of intermodal constraints.

Although containerization removed the limits on ship size imposed by the rate of cargo handling in conventional systems, a new limit superseded it – the size of traffic flow became an important limitation on some routes. In order to fill the new, large containerships, traditional operating patterns had to change. If service frequencies were to be maintained, four modifications to existing service patterns had to take place: (a) service amalgamations, (b) elimination of certain port calls, (c) concentration of large quantities of freight at a few ports, (d) all-round, efficient land/sea interface terminals. All these factors led shipowners to believe that, with containerization, a highly concentrated route structure would ensue, with very large containerships sailing between a limited number of superports, and that onward distribution would be secured by a feeder network of smaller ships, plus the use of inland transport.

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* The World Bank group has financed since its founding in 1946 some 136 port and waterway projects in 100 countries at a total cost of $3.5 billion.

Container systems never, in fact, developed into highly concentrated route structures. (This is not to say the distribution of container capacity is not highly slanted both in terms of routes and ports.) The initial thinking on concentration never wholly materialized for a number of reasons: (a) the economies of size of large containerships were not as powerful as first anticipated; (b) the economies of scale in terminals were much weaker than expected; (c) to achieve wide network distribution by feederships, costs become exorbitant; (d) certain classes of high-value cargoes lure lines from rigid, concentrated route structures.

Route Structures and the Super-Port Concept

Table 1, and Figures 1, 2, and 3 show the relative world-wide distribution of container capacity and current service configurations. The table and diagrams clearly demonstrate that the present-day reality of container-line operating practices is far removed from the philosophy surrounding the original concept. The services that developed became hybrid, with a mix of various strategies that included multi-porting exercises of the main vessels together with feedership extension, cross-route transshipment, etc. The net effect was to produce a system of services, the overall strength of which was stronger than the sum of its individual ports. This combination of services proved to be more economical and financially rewarding for the shipping companies.

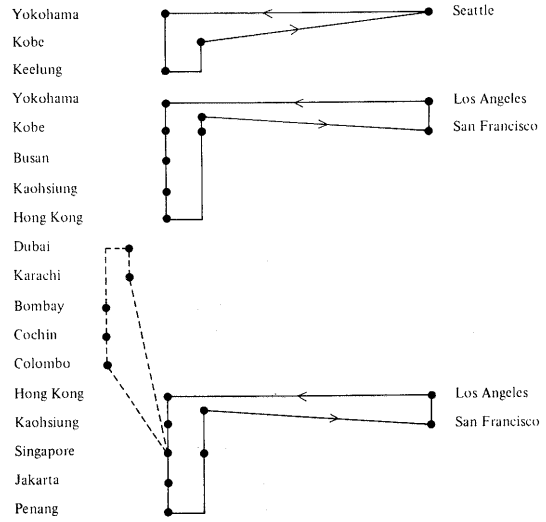


Figure 1: American President Lines, Pacific Services

Source: Marine Transport Center, University of Liverpool

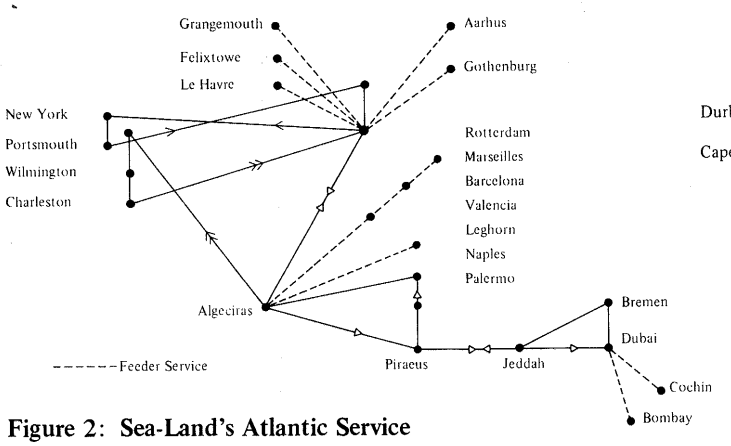


Figure 2: Sea-Land's Atlantic Service

Table 1: Proportion of Total Annual TEU Capacity Destined to/Originating from Each Geographical Region

Region	Cellular	Ro-Ro	Semi-Container
TOTAL TEU	7,703,141	3,803,520	2,262,033
North America	30.1%	16.9%	26.8%
Europe	24.3%	30.9%	24.7%
Far East	23.0%	5.8%	7.2%
Australasia	4.6%	3.3%	1.4%
USA Coastal	3.7%	4.0%	7.0%
Middle East	3.3%	23.6%	5.2%
South Africa*	1.7%	0.4%	1.8%
West Africa	0.9%	0.8%	5.9%
USSR	0.8%	0.3%	0.2%
Caribbean	0.7%	0.6%	1.2%
South America	0.2%	2.8%	4.3%
Indian Sub-Continent	neg.	0.1%	0.4%
Multi-Regional Routes	5.9%	8.5%	11.2%
Miscellaneous	0.7%	0.3%	1.6%
Roundworld Eastabout	–	1.3%	1.0%
Roundworld Westabout	–	0.3%	0.1%
	100.0%	100.0%	100.0%

Notes:
* Inclusive of other ports of Africa, excluding West Africa.
Source: Marine Transport Centre Ship Deployment Data Files.

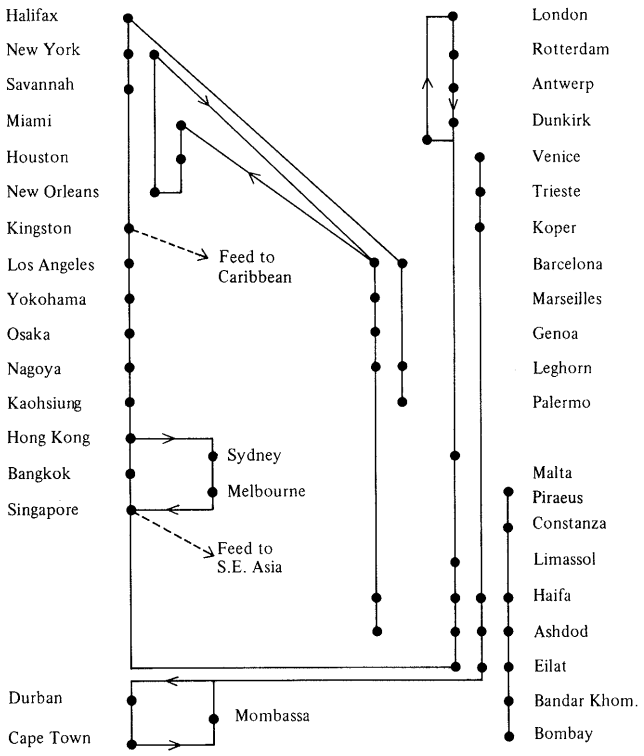


Figure 3: Zim World-wide Services

Vessel Sizes

Vessels in the 4,200 TEU range will provide excellent economies at sea and will surely reduce the cost per container transported below that of a 1,500 or 2,700 TEU vessel, provided of course that sufficient cargo is available to utilize these large-capacity vessels. But is there sufficient cargo? We all agree that there is already overcapacity on the major routes, though there is no agreement on the percentage. (That remains a secret with each of the shipowners.)

Two such unconventional operators – U.S. Lines (Mr. Malcom McLean), with its new 12 x 4,218 TEU vessels, and Evergreen (Mr. Yungfa Chang), with its new 21 x 2,728 and 3 x 2,341 TEU vessels – will be operating in areas that are already facing overcapacity. The competitive impacts of the expansion strategies pursued by these two self-made shipping entrepreneurs is something that the traditionally minded container carriers rightly fear and respect; while in the same breath, they denigrate Messrs. McLean and Chang for their "irresponsibility" in ordering speculative tonnage not related to the development of the trade. Evergreen is offering rates that are 20% below conference rates and maintaining that it will make profits.

In the macro sense of planning, a question must be raised – Are we not falling into the same trap into which we fell just 10 years ago with the ever-increasing sizes of the ULCC? The sky seemed to be the limit and, following the 500,000 D.W.T. super-giants, the designs were ready for the 1 x 10^6 D.W.T. or even 1.5 x 10^6 D.W.T. vessels. We do not have to elaborate here on the sad situation the large carriers are in today.

Marine Container Terminal

The contact between vessel and shore becomes an intricate interface operation, since the port has ceased to be the terminal point of cargo interchange (see Fig. 4). The junction of the port and its facilities are now so complex that without the use of advanced technology, we are unable to obtain all objectives and conditions for surviving in a highly competitive environment. To name just a few of the objectives: (a) minimization of ship turnaround time in port; (b) minimization of holding time of cargo in the port area, with reduction or even elimination of cargo-holding costs; (c) minimization of unforeseeable delays, including the effects of strikes, human error, etc.; (d) maximization of integration of port services with other transport modes interfacing at the port; (e) maximization of ability of port operations to cope with changing technology of the port users (ships, transport systems, packaging, etc.). These objectives must be achieved in order to meet the competition of other similar facilities aiming at capturing the same market.

In order to survive, port facilities must become fully integrated into the intermodal transportation system, of which the ship and the port are only a part. Impressive strides have been made by some ports in raising berth throughputs and land utilization. Some of the larger and more efficient terminals are shown in Table 2. With all their efficiency, however, very few terminals have overcome the barrier of 50,000–60,000 lifts per crane per year, the main reason being that the handling rate of container cranes is only one component of the system. Because of long container dwell-time, slow operations in the container

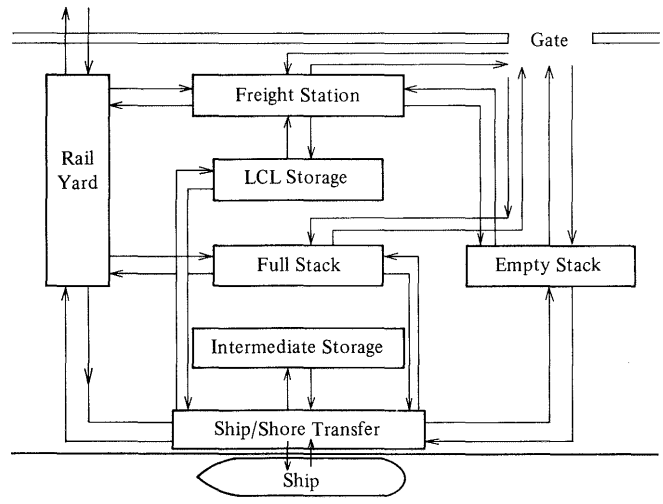


Figure 4: Ship Port Interface

Source: E.G. Frankel, Container Shipping Operations

park, ship waiting time caused by random arrivals, customs, etc., the actual limits are invariably curtailed.

International trade is becoming an ever-more important factor in the economic growth and development of many countries. Unless the transportation facilities and technologies of these countries (relating to vessel, port, and intermodal through transport) develop in line with the other trading partners, it will greatly impede effective trade, since it will make the cost of such trade for the lagging country more expensive than necessary.

The importance of forward technological planning as an integral part of the physical master planning has not yet been fully recognized.

New technology will not only be applied in infrastructure and equipment, but it will play a major role in management planning, decision-making, and development of overall policies and strategies. These in turn will lead to improved output and productivity of operations and cargo handling; better use of facilities, equipment, and manpower; and the important interface of port and other transport modes. In the past, port development responded mainly to requirements of the users. Ports seldom initiated new technologies. R and D was almost unheard of, despite the fact that the world port industry had a turnover in excess of $80 billion a year. The new realities in planning, which apply equally to shipowners and the port industry, include (a) risk analysis of traffic forecasts to determine the uncertainty of demand projections; (b) transport and cargo-handling technology forecasts; (c) institutional and political development projections, including forecasts of regulatory changes; (d) environmental analysis and impact assessments; (e) market and competition trend projections; (f) intermodal technology and choice forecasts; (g) cargo form projections; and (h) operational and interface development forecasts.

New Terminal Technologies

Some of the most important recent developments in container and unitized cargo-handling technology are as follows:

- Belt Container Conveyors serving one lane under transtainers, portainers, or gantries and designed to feed a continuous flow of containers to a static position

Table 2: Container Handling Rates for Major Terminals

Port	TEU/YR/M	1983 TEU/YR	TEU/ Crane/ YR	No. of Berths	No. of Cranes	Lifts per year/ crane*
1. Kaohsiung, Taiwan	514	1,334,000	88,930	11 (2,594 m)	15 (35 ton) + 2 mobile	64,030
2. Singapore	600	1,087,000	60,390	6 (1,809 m)	18 (30–35 ton)	43,200
3. Yokohama, Japan	373	746,800	53,340	2,000 m	14 (30.5 ton)	40,000
4. Keelung, Taiwan	378	737,000	81,900	8 (1,950 m)	9 (35 ton)	57,230
5. Hong Kong (Modern Terminal)	721	653,800	93,290	3 (905 m)	7 (35 ton)	65,300
6. Jedda, Saudi Arabia	208	580,000	72,500	6 (2,780 m)	8 [305(6), 40(2)]	52,900
7. Pusan, South Korea (Piers 5 and 6)	422	532,500	59,166	4 (1,262 m)	9 [30.5(8), 40.6(1)]	46,200
8. Baltimore (Dundalk)	232	398,100	39,810	6 (1,715 m)	10 [40(6), 50(2), 60(2)]	34,080
9. Rotterdam (Waalhaven, Pier 7) (fully automated, computer controlled)	412	330,000	63,000	800 m	5 (60 ton)	47,200
10. Algeciras, Spain (Sea Land)	538	296,000	74,000	2 (550 m)	4 (30 ton)	53,300
11. Hong Kong (Sea Land)	262	240,000	80,000	1 (305 m)	3 (30 ton)	54,900
12. New York	328	179,800	59,930	2 (548 m)	3 (40 ton)	44,800

*Including empty containers; when accurate data unavailable, 25% of 40′ was assumed.
Source: Containerization International Year Book, 1984.

under these handling devices and, therefore, eliminate their longitudinal movements. These conveyors are usually also equipped at each end with automated truck or trailer transfer devices of containers between truck or trailers and the conveyor belt.

- Computerized Stacking Control, which provides optimum stacking and unstacking sequences and stack-cell allocations, is designed to minimize transtainer and gantry working time as a result of ship loading and unloading time. This type of system is usually coordinated with computerized containership cargo planning, which minimizes container rehandling requirements while maintaining all the ship's particular requirements.
- Automated Container Inventory and Storage systems are designed to stack and recall automatically any container and transport it to or from a transfer station interfacing with pierside gantry belt conveyors to the freight station and inland transport system. Various container chain-type, retracting, and shelf-conveyor-type automated container warehousing systems have been developed.
- Batch Container Handling attempts to permit handling transfer and storage of blocks of coupled containers. Several methods for the handling of blocks of standard coupled containers are under investigation. Most are based on transversely assembled blocks of 20′ or 40′ containers, 2 to 3 high, and 2 to 8 wide.
- Container Elevators and Sideload Devices, similar to shipside pallet loaders, are designed to transfer containers to or from pierside to ship decks. The elevators are fed by side-load devices. The elevator either transfers containers from pier to ship or extends like pallet loaders into the (noncellular) box-type ship hold, where conveyor, cushion pallet, or rail device transfers or distributes the containers transversely across the ship's width.

These and other developments are all designed to facilitate container-transfer sequence control and ship or feeder turnaround.

One of the recent developments in gate handling is the introduction of remote TV inspection stands permitting trucks with correct documentation to proceed immediately to the container storage areas – without waiting in line with other trucks with problem documentations.

In addition, there are many developments, such as self-consolidating/deconsolidating containers, collapsible containers, inflatable containers, disposable containers, and more. All of these developments have an impact on port handling, transfer technology, and operating requirements and will continue to demand dynamic change of port facilities, equipment, and procedures.

Container control and logistic systems (CCLS) optimize container utilization by following the container's movement from arrival through departure. The container's location within the intermodal transportation system is immediately available (on-line computer), thus permitting maximum efficiency. Container-handling equipment suppliers (most notably, crane manufacturers) are now offering equipment that is largely automated, including transmission, receipt, and communication with terminal-operator controls. Semi-automated land-side handling as well as quayside handling equipment are becoming more popular. For ports where physical expansion is unfeasible, other solutions, based on fully automated container handling in high-density marine terminals with high-rise warehouses for stacking, are being developed.

This type of solution may be economically worthwhile in ports located in expensive land areas. Such a fully automated solution supplies the answer to maximum land utilization, increased terminal production rates, effective interface with road and rail, computer inventory control, and computer-processed management.

The problems that can result from the reduced operational flexibility of automated equipment must be taken into account at the early planning stages, as any breakdown

caused by mechanical failure or human error can bring the entire operation to a standstill.

The more accepted form of port development, however, continues to be the creation of increased land areas in combination with automation of cargo-handling operations. The following are some examples of such development: (a) the port of Baltimore is providing 4 new container cranes at Dundalk Marine Terminal and plans 2 more terminals with 200 ha. of land at a total investment of $200 million; (b) the port of Los Angeles (which has recently been losing traffic) has started a five-year development plan, estimated at $385 million, to include construction of a 20-mile railway and the reconstruction of the International Container Transfer Facility; (c) the Port of San Francisco is planning to invest $42 million to expand and improve container handling and intermodal transfer facilities to allow the port to compete more aggressively with the neighboring port of Oakland; (d) the port of Singapore is expanding its container storage area from 61 ha. to 100 ha. to hold 60,000 TEU (doubling the present capacity).

Future Shipping Technologies

Even the fourth and fifth-generation container vessels, which can carry 4,200 TEU and cost $60 million per unit (excluding 3.8 x 4,200 x $4,000/TEU = $64 million cost of boxes allocated to each ship), are still loading and unloading boxes one by one. Even with the best of outputs, these ships will spend about two days in port in order to load and unload 1,000 containers in each direction.

Containerships of the future will have to find ways of simultaneous discharge of containers, as opposed to the serial unloading of today. Various vessel designs are being developed, though it may take some years before the first prototypes are available. Among the more interesting of these ideas are multi-hulled vessels, such as catamarans and trimarans for stacked-deck-carrying, enabling handling of blocks of standard coupled containers; semi-submerged catamarans that could straddle fixed or floating piers or barges preloaded with stacked containers, which would be directly loaded/unloaded onto the vessel, which would change its draft by ballasting/deballasting (the catamaran would operate like a floating dock crane ship lifting/discharging large blocks of several hundred containers). Port planners must consider such shipping developments in order to prepare for the future.

Bulk Shipping and Bulk Ships

Ocean transportation of raw material is probably as old as shipping itself; but until thirty years ago, bulk shipping was more or less an element in general cargo tramp services, after which the modern bulk shipping concepts developed. During the first twenty years of modern bulk shipping, the development has been characterized by enormous growth in volume of trade, in fleet, and in ship size. Progress in shipping methods and cargo handling, however, has been remarkably modest. Ocean bulk shipping over the past 35 years can be divided into different epochs:

1945 – 1959

Apart from some few captive ore trades, international trade in raw materials following World War II was quite modest. In all essentials, it was carried by small trampers – first mainly by 10,500 D.W.T. Liberty vessels, mass produced in the U.S.A. during World War II, and later by shelterdeckers of sizes up to 13,000 D.W.T. In the wake of the Korean War in the early 1950's, European and Japanese steel production expanded rapidly, requiring large imports of iron ore and coking coal. At the same time, grain trade from the U.S. Gulf developed rapidly. Both developments brought about the introduction of specialized bulk carriers in the range of 15,000–30,000 D.W.T.

Shipbuilding expanded strongly during the mid-1950's, but in 1957 the shipping markets were hit by a strong depression. In order to stimulate contracting and strengthen the competitive edge of their new, modern yards, the Japanese shipbuilders introduced 60%–70% credit over 6–7 years at very reasonable interest rates. The European yards followed with similar finance schemes, and since then shipyards have generally offered extensive credits for newbuildings. The introduction of high suppliers' credit changed the name of the game. Bulk shipping became a financial game for many newcomers who had no knowledge of the intricacy of shipping – and often did not care as long as the going was good. Speculative shipping practices mushroomed, bringing some successes and many more failures.

1960 – 1974

Bulk shipping experienced exceptional growth in the 1960's and early 1970's, stimulated by the modernization and expansion of steel industries in Japan and in Western Europe, necessitating large-scale imports of iron ore and coking coal.

New economic criteria developed during this period: (a) economy of scale in steelmaking, shipbuilding, and transportation; and (b) rationalization in ship operations. In order to achieve this, two other developments were required: (a) creation of large industrial port complexes; and (b) construction of large combined carriers (OB and OBO), which proved competitive in the ore and coal trades.

1975 – 1978

In the wake of the oil crisis came a depression in the world economy, which caused a drop in all shipping markets in the mid-1970's. Actually, bulk shipping would not have been in such bad shape had it not been for all the combined carriers that transferred from the collapsing tanker market to the dry bulk markets, thus inflating the fleet supply.

Depressed freight rates and lack of employment resulted in severe debts and liquidity problems for many shipowners, and many companies collapsed. This brought the secondhand values of ships down to levels completely out of proportion with newbuilding prices. Most buyers found these secondhand vessels most lucrative investments, and only few took advantage of the low shipbuilding prices offered by the large, underemployed shipyards for new vessels.

Before discussing developments during the past six years (1979–1985) and the future outlook, let us briefly introduce some figures relating to our analysis of past seaborne trade.

General: Over the past two decades, total seaborne dry bulk trade by vessels over 18,000 D.W.T. has shown exceptional expansion:

1960: 40 million tons
1965: 170 million tons
1970: 440 million tons
1975: 670 million tons

1980: 920 million tons

Up to the late 1970's the steel industries of Japan and Western Europe played a dominant role in the demand for ships.

Steel Industries: Shipments of iron ore to Japan reached some 135 million tons in 1980, and 125 million tons to the EEC. The relative importance of the steel industry to ocean bulk shipping, though quite dominant, shows a steady decline, as illustrated by the following figures:

1960: 90%
1965: 70%
1970: 60%
1975: 50%
1980: 40%

It is expected that the relative importance of the steel industry for employment of bulk shipping will continue to decline in the future, probably reaching about 35% in 1990. The steel industry, however, will most likely remain the most important single factor of employement for the large bulk carriers through the 1980's.

Iron ore is still the largest single commodity, in particular in the larger ship sizes. It accounts, at present, for about 50% of employment for bulkers over 40,000 D.W.T. and 75% of employment for bulkers over 100,000 D.W.T. Iron ore is normally shipped to large industrial port complexes and carried by gearless vessels up to 280,000 D.W.T.

Coal: Up to 1980, coking coal dominated seaborne trade in coal, in particular in the deep sea hauls. Seaborne trade in steam coal expanded after 1976 and is expected gradually to become the dominant of the two qualities.

	Coking Coal	Steam Coal
1977:	75%	25%
1980:	65%	35%
1984 (estimate):	60%	40%

Grain: From 1975 to 1980, annual seaborne grain trade by bulkers and combined carriers almost doubled, from 90 million tons to 165 million tons. Grain trades tie up much tonnage volume per ton-mile because of long port times and reduced cargo-weight intakes. The strong expansion in grain trade played a vital role for the employment of bulkers through the crisis of bulk shipping in 1975–1978.

The three major commodities – iron ore, coal, grain – accounted in 1980 for the following shares of dry bulk employment for vessels over 18,000 D.W.T.:

Iron ore:	30%
Grain:	21%
Coal:	16%
	67%

Of the 16% for coal, coking coal accounted for 11% and steam coal for 5%.

The remaining commodities in dry bulk trade are gathered in one group: "Other Bulk Cargoes." In aggregate, the trade volume of this group is of the same order as iron ore, but individually each commodity cannot compare with the major commodities. In 1980, the most important of the minor commodities were as follows:

Forest products:	5.5%
Cars:	4.5%
Steel products:	3.5%
Bauxite/alumina:	2.5%
Phosphate rock:	2.5%
Cement/cement clinkers:	2.5%

1979 – 1982

The first jump in OPEC oil prices in 1973/74 from US$3 to US$8 per barrel did not have much effect on the seaborne trade of steam coal. The subsequent price hikes, which pushed crude to US$32 per barrel in 1979, triggered the switch "from oil to coal." Many cement plants, power stations, and other industries switched from oil to coal as soon as they were able, which resulted in the rapid growth of the seaborne steam-coal trade. Shipowners became more optimistic; the prices of secondhand bulkers tripled within a short period – bringing them in line with newbuilding prices. This euphoria resulted in the hectic contracting of new bulkers, tied to an inevitable rise in shipbuilding prices. Most shipyards had their order books for bulk carriers filled up to 1983/84.

1982 to Date

In spite of most forecasts, there has been a sharp decline in bulk shipping and shipbuilding activities since 1982. This was especially evident in the oil-tanker fleet (down from 3,300 vessels totalling 332 million D.W.T. in 1978 to 2,645 vessels totalling 265 million D.W.T. at the end of 1984). Combined carriers declined somewhat less (from 420 vessels totalling 48.7 million D.W.T. in 1978 to 350 vessels totalling 41 million D.W.T. at the end of 1984). Bulk carriers fared relatively better, increasing their fleet somewhat (from 4,000 vessels totalling 135 million D.W.T. in 1978 to 4,850 vessels totalling 187 million D.W.T. at the end of 1984).

The reality of economic activities changes much faster than the building of a ship or the construction of port facilities. The best of forecasts can be overturned by unforeseen circumstances – a shift in East-West relations, a crisis in the Middle East, the position of OPEC, the strength of the dollar, etc. Conservative shipowners, aware of the unforeseen difficulties, are usually more cautious than speculative newcomers, who can cause untold damage to the industry by forcing the old-timers to keep up with them in order to remain in the game. This can cause the collapse not only of fly-by-night operators, but even of well-established concerns.

Ships ordered at the height of the economic boom are only now being delivered when the market is depressed. Many shipowners know that when they take possession of the vessels, these will join the ranks of underemployed or even laid-up units.

Similarly, bulk-loading facilities whose construction was started during the boom will not be fully utilized upon their completion.

Development in Bulk-Handling and Shipping

Despite growth in traffic and in ship sizes, progress in bulk-cargo handling methods of ocean bulk shipping has until now been quite modest. The loading of bulkers, normally by conveyor-belt-type shiploaders travelling on the piers, is a fairly rational operation, with capacities for some modern loading berths for iron ore up to 14,000 tons per hour and for coal up to 6,500 tph.

Unloading methods, however, normally based on grab unloading, are far less efficient and also quite costly cargo-handling operations. Modern unloading berths may have average capacities of up to 3,000 tph for iron ore and 2,000–2,500 tph for coal. Cleaning of the holds is a particularly time-consuming and expensive phase in the

unloading process. In addition to low capacities, grab unloading also suffers from costly piers, equipment, and dredging. Dust losses and environmental protection are also problems linked to grab operations.

In the past, there has been much interest in the development of continuous bulk unloaders as a step in the direction of more efficient and automated unloading processes for bulk carriers. A number of continuous unloaders of low capacities have in recent years successfully been installed for the handling of commodities like cement, fertilizers, and grain. The main reason for introducing such equipment has normally been to avoid material losses and to protect the environment. The future may bring continuous ship unloaders operating in major coal ports. To what extent these will represent a major improvement compared to grab unloaders remains to be seen. Their capacities are still modest and their costs still very high.

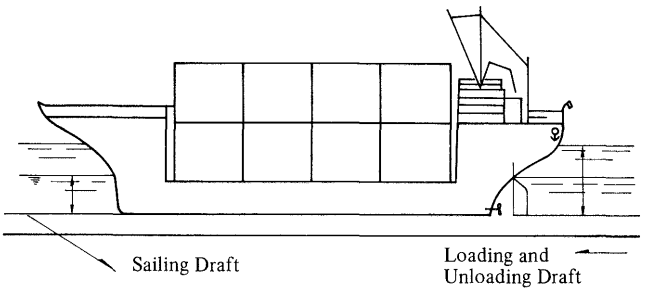
Ocean bulk shipping has comething to learn from Great Lakes operations. Bulk shipping on a large scale has a longer tradition on the Great Lakes than it has in ocean trade. Over the past 20 years, gravity-type self-unloaders have completely taken over coal and iron ore traffic on the Great Lakes. These ships are capable of unloading at rates of 10,000 tph for iron ore and 6,000 tph for coal. The unloading terminals are extremely simple, and no shore-based assistance is needed to serve these vessels. Despite the high volumes of trade and the intensive traffic, congestion problems are practically non-existent on the Great Lakes.

Until now, the concept of gravity-type self-unloaders outside the Great Lakes has only been utilized in ships designed especially for captive industry trades in commodities such as gypsum, phosphate rock, salt, alumina, limestone, and sand. Back in the 1960's, Marcona launched its idea of marine-slurry transportation. Some slurry vessels were built, mainly for dedicated captive trades in iron ore concentrates and iron sands, but since the early 1970's further progress seems to have halted. Slurry transportation is a self-handling concept. Its main merit is simple infrastructure in ports and in shore transportation – its drawback, all the water to be handled and carried. Presently, coal people are looking at slurry transportation as a solution to solve severe infrastructure problems in ports and in shore transportation in connection with their coal-export projects.

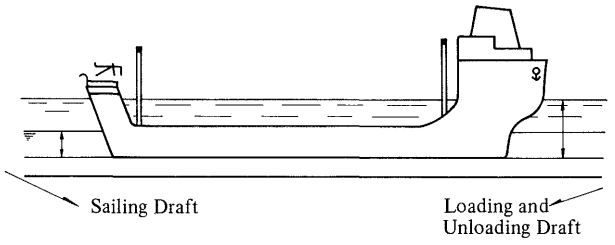
Pneumatic bulk-handling methods mean either extremely high-power consumption or very low cargo-handling rates. In consequence, pneumatic methods are mainly put to use in small, specialized vessels for cement, grain, and other pulverized commodities.

In summing up, one may conclude that large, efficient continuous ship-unloaders will eventually replace the conventional grab-unloading systems. There may be a revival of the coal-slurry carriers in certain trades, mainly where the physical conditions do not permit deep-draft facilities. The most likely development, however, will be in gravity-type self-loading/unloading vessels similar to those used on the Great Lakes. Both types of vessel could well be of the integrated ocean-going tug-barge system (OGTB).

Port facilities will have to be adapted to receive these new technologies of cargo-handling and shipping by providing infrastructure and specially designed facilities (see Figure 5).



DOCK-BARGE CARRYING SEMISUBMERSIBLE SHIP



HEAVY LIFT SEMISUBMERSIBLE SHIP

Source: E.G. Frankel – Seminars on Bulk Shipping, World Bank, 1985

Figure 5: Dock Type Ships – Semisubmersible Ship

Conclusion

The development of new technologies in shipping and cargo-handling systems is different for unitized and bulk cargoes. This applies to the vessels themselves, the ports of call, and the cargo-handling systems.

Container Traffic

Even the largest fifth-generation container vessels, including the 4,218 TEU giants, have no physical constraints in using most of the world's deep-sea ports.

Since nearly 90% of all containerized traffic is between developed and industrialized countries, shipowners will select the port of call according to transportation/economic/operational considerations: cargo availability, effective intermodal integration with the transportation system of the hinterland, modern and efficient cargo-handling equipment and automated systems, operational reliability, guarantee of short turnaround times, etc.

While most basic infrastructure of modern ports is adequate to berth large, technologically advanced vessels, ports compete with one another to become a major port of call by offering a better level of service. Port authorities – whether private or public – are investing large sums in order to attract major lines. Similarly, the shipping lines competing for the same cargo try to outdo one another in the level of service offered: i.e., fixed-time sailings, modern vessels, availability, and control of containers from door-to-door, etc.

Containerization in Developing Countries

Ports in most of the developing countries need only make small investments in order to attract container vessels. They have limited quantities of containerized cargo and are a captive market. The investments made are aimed

at providing minimum services to container vessels in order to benefit from the transportation economies that containerization provides. The shipping companies, however, make larger investments, since they must offer high-level service in order to compete for the limited cargo quantities per call. They hope, by competitive service, eventually to capture a larger share of the market, while in the meantime utilizing earlier-generation vessels that might otherwise be unemployed.

Bulk Traffic

Unlike container vessels, bulk vessels have undergone vast changes in dimensions from the 10,000 D.W.T. tramp ship in the late 1930's to today's 500,000 D.W.T. ULCC ships with drafts of over 25 meters. This has necessitated enormous investments in creating infrastructure and facilities to handle the new generation of vessels. Industrialized countries are, of course, better able to face the costs involved, as the raw materials which arrive in the huge bulkers are used in their industries or in the production of food.

The developing countries, from which much of the raw materials originate, must build suitable facilities in order to export their raw materials. In many cases, they are competing with each other in a limited market; since raw material is bought on an FOB basis, it is the buyer who dictates the type of facilities as a condition of purchase. This forces countries into very large expenditures, which they can hardly afford, and into capital-intensive loading systems, which increases unemployment.

The World Bank and other international agencies are faced with a dilemma. Should one support capital-intensive technologies that will serve developing countries in the macro-economic sense, or should one try to convince industries in developed countries that although advanced technology might suit them, they should consider economic and social realities in the developing countries with whom they trade?

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Port of Los Angeles

(Extracts from "1985 Annual Report, Port of Los Angeles")

Executive Director's report (extract)

WORLDPORT LA: It's today's Port of Los Angeles. It's a harbor distinguished by its versatility and responsiveness to the future needs of worldwide shipping.

WORLDPORT LA is the newest member of an exclusive "Millionaire's Club" for container throughput.

It is now the second busiest passenger port in the United States.

It is the site of an ongoing, $500 million capital improvement program unparalleled in the port industry.

It's the gateway for all West Coast coal exports.

And it will soon offer shippers the largest international intermodal railyard in the nation.

WORLDPORT LA has become a world center of commerce, navigation, recreation and commercial fishing. Charged by the citizens of California to provide for these activities, the Port has met the challenge and surpassed it.

At WORLDPORT LA, waterfront recreational and tourist attractions coexist with thriving cargo terminals and the commercial fishing industry. It's a port that serves virtually everyone.

Any commentary on the Port's past achievements and future goals must first acknowledge that this is a story of many people moving forward together. This highly diversified, man-made harbor relies and has always depended upon talented, dedicated people – the thousands of tenants, customers, employees, legislators, port officials, longshoremen and labor officials and community supporters who have shared in the Port's seventy-eight year climb to status as a world port.

Tenants Help WORLDPORT LA Top a Million

There is among international ports a group of perhaps a dozen that belong to an unofficial "Millionaire's Club" for containerized cargo handlers. These few harbors each record an annual throughput exceeding one million TEUs, maritime terminology for container conversion into 20-foot equivalent units. In fiscal 1985 WORLDPORT LA, with a 30 percent increase to 1,037,092 TEUs, joined this distinguished group of "Millionaire" ports.

Taking advantage of WORLDPORT LA's expanding intermodal capabilities, the Port's many shippers have been primarily responsible for this tremendous growth. Even with larger ships typically carrying a greater volume of cargo, total vessel arrivals increased to 3,444 last year as compared to 3,146 in fiscal year 1984.

General cargo tonnage through the Port reached 22.2 million revenue tons, a 34.5 percent increase over last year, and net income increased by 16.9 percent to $48.7 million, largely because a number of tenants were able to expand their cargo handling facilities.

Indies Terminal, which has added three container cranes and two berths to its already bustling break bulk facility, continues to attract the business of steamship lines seeking such multipurpose capability.

Evergreen Line, now the world's largest steamship company, continued to grow at an astounding rate and, as a result, recently expanded its facilities at Seaside Container Terminal Complex.

And American President Lines, one of the largest U.S. flag companies, noted for innovative intermodal systems development, now fully occupies a 115-acre West Basin facility, which accommodates Westwood Shipping. Hoegh Container Services, Italia-d'Amico Joint Service and Philippines, Micronesia & Orient Navigation Co. (PM & O Lines).

WORLDPORT LA: A Port for Today and Tomorrow

Development at WORLDPORT LA, whether for commercial or recreational purposes, must be considered in light of the needs of shipping in the years to come. Estimates by the U.S. Army Corps of Engineers indicate that eight new terminals and a combined total of 2,600 acres of new land will be required to properly accommodate the shipping needs of San Pedro Bay by the year 2020.

Using the 2020 Plan as a goal, WORLDPORT LA's management has embarked on two shorter range dredging and landfill projects which will help meet land requirements three decades hence.

Late in 1984, the Port accepted the application of the Pacific Texas Pipeline Company to construct a 1,030-mile pipeline which will run from a 115-acre landfill in the Port's outer harbor to a site in Midland, Texas. The landfill will be created by dredging an entrance channel 75 feet deep. In accepting the application, the Port assumed status as a co-lead agency working with the U.S. Bureau of Land Management to obtain all necessary environmental permits for the $1.6 billion project. A Draft Environmental Impact Report/Environmental Impact Statement for the project was published in June, moving the pipeline one step closer to completion. According to the schedule, the Pacific Texas Pipeline will be operational in 1987.

In line with both the 2020 Plan and the Pacific Texas Project, the Port is also pursuing plans for a South Landfill Project which will create a 340-acre parcel and a 70-foot channel from the breakwater to the 190-acre landfill completed in 1983 as part of the Port's Main Channel Deepening Project. This South Landfill Project, for which construction costs have been estimated at $180 million, responds to environmental concerns regarding relocation or consolidation of hazardous liquid bulk facilities, and will be a further step toward meeting the landfill requirements outlined in the 2020 Plan.

The Making and Marketing of a World Class Port

The success of any port is contingent upon its ability to

attract and retain international steamship companies and shippers. Worldwide presence enhances international recognition. Knowing this, WORLDPORT LA has established a global network of marketing specialists. Each of the eight international offices and domestic representatives in the Midwest and on the Eastern Seaboard are supported by cargo and transportation specialists at the headquarters office. Together, these marketing specialists provide vital contact with principals of the international shipping industry. Individually, they provide the expertise and personal attention that WORLDPORT customers have come to expect.

WORLDPORT LA is also concerned with the needs of the thousands of other individuals who keep the Port growing. From dockworkers to office workers, from repairmen to fishermen, from tugboat operators to truck drivers, from crane operators to computer technicians, from stevedores to switch operators, from the cruise passenger to the family visiting Ports O' Call Village, the Port of Los Angeles tries to serve every one of its citizen owners.

Perhaps one event last year best symbolized the Port's spirit of friendship. When a delegation from Los Angeles' sister port of Huang Pu in the People's Republic of China made its first visit to WORLDPORT LA, the group was welcomed with open arms. With this sharing of maritime know-how, culture and tradition, WORLDPORT LA is expanding its international trade presence, strengthening the bonds of friendship and demonstrating its genuine concern for people around the world.

Ezunial Burts
Executive Director

Balance Sheets

June 30, 1985 and 1984

	1985 $'000	1984 $'000
Assets		
Current assets:		
Cash and cash equivalents – cash on hand and on deposit with city treasurer	49,162	45,569
Accounts receivable, less allowance for doubtful accounts of $631 in 1985 and $550 in 1984	13,861	12,066
Materials and supplies	1,356	1,099
Prepaid expenses	601	335
Total current assets	64,980	59,069
Cash and cash equivalents, restricted as to use:		
Bond funds	–	5,071
Certificates of participation	128,463	–
Properties:		
Land	142,647	120,296
Harbor facilities and equipment, less accumulated depreciation of $127,562 in 1985 and $114,734 in 1984	256,145	247,311
Construction in progress	81,966	47,183
Preliminary costs – capital projects	1,673	1,244
Net properties	482,431	416,034
Notes receivable	12,470	12,501
Investment in ICTF	2,859	–
Other assets	601	–
Total assets	691,804	492,675
Liabilities, Equity and Retained Earnings		
Current liabilities:		
Trade accounts payable	7,963	8,166
Accrued construction expenditures	7,160	2,850
Current installments of notes payable	3,436	–
Bond indebtedness outstanding:		
To be paid within one year	–	2,241
Bonds and coupons not yet presented for payment	264	450
Accrued interest	2,453	1,118
Accrued employee benefits	3,407	3,099
Deferred interest income	802	796
Total current liabilities	25,485	18,720
Long-term liabilities:		
Notes payable, net of current installments	11,184	8,000
Certificates of participation	140,000	–
Bonded debt – Harbor Revenue Bonds, net of amounts to be paid within one year	–	13,410
Other liabilities	996	1,153
Total long-term liabilities	152,180	22,563
Total liabilities	177,665	41,283
Equity and retained earnings:		
Contributions/land valuation equity	92,314	78,314
Retained earnings	421,825	373,078
Total equity and retained earnings	514,139	451,392
Commitments and contingencies:		
Total liabilities, equity and retained earnings	691,804	492,675

Statements of Operations

Years ended June 30, 1985 and 1984

	1985 $'000	1984 $'000
Operating revenues:		
Shipping services:		
Dockage	6,764	6,062
Wharfage	45,215	39,999
Storage	574	202
Demurrage	2,060	860
Pilotage	2,783	2,377
Assignment charges	1,183	1,540
Cranes	5,287	3,290
Total shipping services	63,866	54,330
Rentals:		
Land	20,577	18,572
Buildings	734	859
Warehouses	1,693	2,031
Wharf and shed revenue	579	544
Total rentals	23,583	22,006
Royalties, fees and other operating revenues:		
Fees, concessions and royalties	1,276	1,189
Oil royalties	2,700	2,826
Other	344	241
Total royalties, fees and other operating revenues	4,320	4,256
Total operating revenues	91,769	80,592
Operating and administrative expenses	36,512	35,703
Income from operations before depreciation	55,257	44,889
Provision for depreciation	13,192	10,911
Income from operations	42,065	33,978
Nonoperating revenues (expenses):		
Other income and expenses, net	562	1,459
Interest income from investments	6,294	6,876
Interest expense on bonds and note	(174)	(616)
Net nonoperating revenues	6,682	7,719
Net income	48,747	41,697

International maritime information: World port news:

Co-operation between Ports: UNCTAD

(Extracts from UNCTAD documents: TD/B/C.4/AC.7/4)

INTRODUCTION

1. The members of the Group of 77, meeting in Buenos Aires in 1983, adopted a resolution on shipping which, *inter alia,* requested the UNCTAD secretariat to prepare a draft programme of action for co-operation among developing countries in the area of shipping, ports and multimodal transport. At UNCTAD VI the Conference confirmed this request and asked the secretariat to submit the draft programme to the Committee on Shipping.
2. At an Economic Commission of Europe meeting on transport held in October 1984, the most important conclusion was the need to establish close co-operation between the various Mediterranean ports.[1] The areas of co-operation noted were: exchange of information and experience; training; data processing; and harmonization of port statistics.
3. A draft programme of action for co-operation among developing countries in the field of shipping, ports and multimodal transport[2] was presented at the eleventh session of the Committee on Shipping in November 1984. For ports, six areas of possible co-operation were identified:
   (a) Development of transhipment ports,
   (b) Harmonization of port statistics,
   (c) Harmonization of port tariffs,
   (d) Joint dredging and marine salvage operations,
   (e) Technical and marine salvage operations,
   (f) Technical expertise exchange, and,
   (g) Training.
4. At that session the Committee on Shipping, in its decision 54 (XI), invited the Secretary-General of UNCTAD to convene an *ad hoc* intergovernmental group of port experts to review the practical problems which arise in respect of the development, improvement and operation of ports. One of the terms of reference of the group is to consider ways in which technical co-operation between ports can be of mutual benefit and make suggestions on how technical co-operation programmes could be instituted, taking into account the co-operation already existing at the international level. The co-operation thus included the possibility of North-South co-operation as well as South-South. Important bodies for assisting ports authorities in achieving co-operation are the regional and international port organizations which are listed in annex I. The purpose of this report is to provide material for the considerations of the inter-governmental group.

I. AREAS OF CO-OPERATION

A. Development of transhipment ports

5. The traditional pattern of shipping involved the movement of consignments direct from port of origin to destination in a single voyage. Technological developments in recent years have created a situation in which regular transhipment can significantly reduce the over-all costs of maritime trade.[3] Notable among the influences have been specialized cargo-handling facilities in ports, increased ship sizes, greater precision in voyage times, and improved information flow for the efficient control of complex cargo movements.
6. A form of transhipment of particular interest to developing countries is that where, for a particular cargo type (such as containers or dry bulk), a single port in a region develops as a terminal for long-haul voyages at which cargo is trans-shipped to and from feeder vessels. Economies may be obtained principally from two sources: (1) through lower port investment – since only one port need invest in capital dredging and cargo handling equipment for large modern vessels; and (2) through lower shipping costs – since expensive vessels avoid calling at several ports in the same region, each for a small amount of cargo. Supplementary economies may arise for shippers through more frequent services, opportunities to order in smaller quantities, and the possibility of using larger ships.
7. The benefits of a transhipment operation will be reflected in reduced through-transport costs, but maximum benefit can be achieved only with rationalization of both ports and shipping services. Trends in shipping already support transhipment and it is natural that ports take the initiative to derive the maximum benefit for their national economies. The disadvantage of transhipment is the additional handling of the cargo and the longer transit times for the cargo.
8. Two types of problems have to be tackled: technical, to define just what steps each party should take: and economic, to ensure that each party receives sufficient benefit to justify the costs of its contribution. The first technical requirement is to identify one or more ports to be developed as transhipment points. The second one is to establish what facilities must be provided at the transhipment port and in the feeder ports. For economy in the feeder services, it would be natural to standardize on methods for ship discharge and loading, for example self-geared or ro/ro feeder vessels.
9. There are two clear impediments to concerted action on transhipment ports. First is the complexity and innovation required to ensure a fair distribution of benefits. Second is the natural reluctance of many countries to accept dependence on transport facilities provided by another State. However, to ignore the possibility of co-operation in this field has two strong

disadvantages: (1) missing considerable advantages for national foreign trade, including the avoidance of high port investment; and (2) exposing national trade to the risk that adequate maritime services will simply not exist in the future.

10. For dry bulk cargo, a transfer system is presently being investigated in the United States.[4] A system with a capacity to handle 5.0 million tons per year has an estimated capital cost of $US 16 million. The system consists of a floating platform onto which are mounted two screw conveyors, designed to transfer a broad range of dry bulk commodities between very large bulk carriers and feeder barges. The platform is constructed on two parallel pontoons. The semi-submersible platform can be towed to shore-side facilities or to another site. The dry bulk commodities can be transferred in either direction, for top-off or lighter operations. The transfer operation is an enclosed system that minimizes dust and spillage.
11. The multi-purpose transfer system would require a sheltered anchorage and could act as a transfer point for a region for either imports such as grains or exports such as ores. The development of such a facility would allow the users to benefit from reduced transport costs made possible through the use of very large bulk carriers. Such a system has the additional benefit of being mobile and could eventually be transferred to another region.
12. For a container berth, recent development plans financed by international lending institutes indicate an initial capital investment in the range of $US 45 to 50 million per berth, with an annual capacity of 70,000 to 80,000 containers. This creates two problems for a port authority, firstly, the requirement for considerable foreign exchange and secondly, a terminal with a large initial capacity. As around 90 per cent of terminal operating costs are fixed it is essential for commercial viability that large throughputs are achieved.
13. Often the only way to justify the investment is to attract transhipment trade. The danger is that a number of ports in a region will make investments on the assumption that they will be the transhipment or load centre port for the region. Shipping lines and equipment manufacturers do not discourage different ports in the same range from developing as load centre ports. The lines benefit from a more competitive environment, and thus lower handling charges, and the manufacturers benefit from a larger market for cargo handling equipment. To avoid the risk of over-investment there is need for regional co-operation on port development. An intergovernmental agreement whereby one port would be used as the transhipment port for the region, would remove this risk of over-investment. Such an agreement would be for a fixed period of say 10 to 15 years, after which time the feeder ports would receive direct calls if their level of containerized traffic was sufficient. In the meantime, the feeder ports could progressively develop a multi-purpose terminal for handling unitized cargoes. There could also be clauses in the agreement to share investment costs, to recover investment costs, to share profits and to provide training to staff from feeder ports. An exchange of information on, for example, container traffic forecasts for the next five years and development costs would be required first step for such co-operation. A joint regional forecast would be more cost effective than each port commissioning their own regional forecast.
14. To reduce the commercial risks in developing new facilities, port authorities may wish to draw up some model clauses for insertion in the contract with the user. Such clauses could cover:
    (a) Minimum duration that the user will serve the terminal;
    (b) Minimum financial guarantees to be deposited by the user at a local recognized bank or institution;
    (c) Penalties for non-respect of agreed traffic levels;
    (d) Termination of an agreement with standard advance notice; and,
    (e) Sliding tariff scales for regular users for traffic levels in excess of expected activity.

    Port authorities, with the assistance of the UNCTAD secretariat, could develop and agree on such clauses through the regional port associations.

B. Harmonization of port statistics

15. Port management continuously needs reliable information, particularly port performance indicators, for the major operational areas for the following reasons:
    (a) To determine the potential performance of the existing facilities;
    (b) To provide information required for the long-term development of the port, including information on types and sizes of vessels and evolution to door-to-door service;
    (c) To monitor the level of service provided in order that action can be taken, such as increasing the intensity of working and by providing quantified information for consultation with conferences and liner operators, to avoid port congestion surcharges, demurrage payments and even general freight rate increases;
    (d) To monitor utilization and throughput of facilities and equipment in order to fix port tariffs at an appropriate level; and,
    (e) To monitor the productivity of labour and equipment in order to control cargo handling costs.

    Operational efficiency of the port, an essential link in the transport chain, is an important step for economic development.
16. A uniform scheme would allow government planners and port managers to evaluate the performance of their port relative to other ports where comparable. The development of appropriate facilities to serve the region, such as a transhipment terminal, will depend on harmonized port statistics in order to set policies for transhipment for the region, to select the most appropriate location and to determine the facilities required.
17. With the assistance of UNCTAD, two African regional port management associations have developed a uniform scheme of port statistics and performance indicators.[5] A team of UNCTAD staff and experts developed data collection forms, procedures and a set of uniform performance indicators. Seminars were held

bringing together the liaison officers from each port to explain the scheme and discuss its implementation. Specific assistance was then provided to individual ports for the introduction of the scheme. In each region there are individuals who are now capable of providing assistance to other port authorities. This scheme is generally applicable to all world ports. The UNCTAD secretariat suggests that developing countries study this system. Port authorities requiring assistance in implementing such a scheme are invited to contact the UNCTAD secretariat.

18. In the ESCAP region, port authorities have worked together in the development of a Port Management Information System (PORTMIS). This system was developed with the aid of bilateral funding. Implementation is proceeding in the region with funding being provided by the World Bank, Asian Development Bank and UNDP. In this project, trained port personnel from one country have provided advisory services and training assistance to other countries in the region. The PORTMIS model sets quantified management objectives for each department of the port. Management information is then tailored to monitor the attainment of the set of objectives. Thus the system covers all aspects of port operation and not just the cargo handling operation as does the UNCTAD scheme. However the UNCTAD scheme could be used as part of the PORTMIS system provided productivity goals were established.

C. Harmonization of port tariffs

19. Few ports have a wholly rational port pricing system. Port tariffs are often unnecessarily complicated, reflecting multiple amendments of out-dated charges made to satisfy the port's requirements and those of other bodies. The main benefit of simplification and harmonization of the structure of port tariffs would be to ease the calculation of transport costs for shippers. This would not take away the right of any Government or port authority to fix its own level of charges; there would simply be a common tariff structure.
20. A review of port tariffs is a complex task which is a matter for each port authority. The establishment of a common tariff structure would require collaboration between port authorities in order to reach an outcome which reflects the interests of both ports and their users. The forum for such consultations may well be the regional port associations.
21. The ESCAP secretariat has initiated a project to standardize port tariff structures in the region. One of the objectives will be to agree on standard definitions and nomenclature for port charges. A survey of the existing tariff structures in 14 ports in the region has already been carried out. There will be a series of meetings of an expert group to agree on chapter headings, paragraph headings and finally paragraph wording for a port tariff. The goal will be to produce a description of a uniform tariff structure. The project will take two years and is being funded by UNDP. The success of this project will rely heavily on technical co-operation between ESCAP countries.

D. Joint dredging and marine salvage operations

22. To reduce the costs of both capital and maintenance dredging the concept of dredging pools, of either contracted or owned equipment, has been studied. Such an arrangement would reduce mobilization cost and could justify the use of a larger dredger which would shorten the dredging time. An investigation in one region produced an inventory of dredging equipment and dredging requirements. However, the study concluded that a dredging pool for all ports in this particular region was not a practical proposition.
23. Although differences in management structure and lack of common procedures for awarding contracts may detract from the feasibility of a joint venture, co-operation between a smaller number of ports may be more viable. For example, the total annual requirement for maintenance dredging for three ports might total 11 months (6 months, 3 months, and 2 months). Three port authorities could agree to an arrangement whereby one port would purchase the dredger and then lease it to the other two ports for three months and two months respectively. The increased utilization of the dredger would result in lower unit costs and the benefits of this could be shared among the ports concerned. Another example would be a North-South joint venture, whereby the North supplies the capital and expertise including training and the South, a number of countries in a region, lease the dredger and provide the labour and staff required. If payment in foreign exchange is a problem, the possibility of a barter payment arranged through a commercial organization could be investigated.
24. Similar arrangements could apply to the use of salvage tugs and other specialized vessels, such as floating cranes and hydrographic vessels. Not all ports need to own a vessel of every type. Arrangements for pooling the use of such vessels could be an alternative to the traditional handling over of this type of work to foreign companies.
25. Annex II presents a chronological history of developments in joint dredging in one region and illustrates the establishment of a structure of co-operation.

E. Technological expertise exchange

26. A group of countries may be able to exchange or loan technically competent staff among the ports of a region. This would be particularly beneficial to small port authorities which have a limited number of staff. Expertise could cover specialized fields such as:
    (a) Economic port planning – master planning, forecasting, dimensioning facilities;
    (b) Legal – liability questions, insurance policy, claims procedures, use and implementation of international conventions;
    (c) Equipment – equipment selection, preventive maintenance, equipment specifications, tendering procedures, standardization;
    (d) Security – procedures, physical arrangements, staffing requirements;
    (e) Computers – evaluation, staffing, development procedures, software sharing.

For example, in the ESCAP region, a bilaterally funded project seeks to formulate an exchange and mutual co-operative mechanism within the region, through which ports could have access to computer expertise, information and software programmes.

27. This expertise would have the benefit of the officials' awareness of regional conditions and their permanent presence in the region. To establish such an exchange would require the following steps:
    (a) Establishment of a roster of experts;
    (b) Agreement on payment of travel and expenses; and,
    (c) Agreement on terms of reference and work plan.

    The latter two steps would be agreed between the two ports. In general, the port receiving the assistance would pay for travel and expenses which would be in local currency and the port giving the assistance would continue paying the salary of its expert. Such an arrangement would also be possible on a North-South basis and, in this case, the port giving the assistance could also pay for the travel of its expert. Such assistance by its nature would generally be for a short duration. A major advantage would be that the expert would be able to make follow-up visits to assure that the implementation of the recommendations made is progressing.
28. Another method of exchange of technological expertise is the UNCTAD Monographs on Port Management.[6] These are clearly written technical papers devoted to common problems in the management and operations of ports. The monographs have been prepared by those actively involved in the port industry. The International Association of Ports and Harbors (IAPH) has collaborated with the UNCTAD secretariat in the production of these papers.

F. Training

29. There is considerable scope for collaboration between ports in the development and conduct of training. Ports need to undertake training to ensure continuity and improvement of their activities, but especially to cope with technological change. Ideally, this training would all be carried out locally, but there are many practical reasons why a regional approach may be adopted.
30. In the training field various possible approaches to regional co-operation may be adopted, separately or together, among them:
    (a) For on-the-job training, trainees may be sent to neighbouring countries or instructors borrowed from neighbouring countries. This may be *ad hoc* or institutionalized, with particular institutions or instructors developed for specialized purposes;
    (b) For formal training, courses and seminars may be run for regional benefit – either at a single centre or at different institutions in a co-ordinated programme;
    (c) Also for formal training, course materials may be developed, or adapted, for regional use and be shared by all institutions to run their own training courses. In this case, the course could, where needed, include instructors borrowed from other institutions or a training centre.

    Locally developed and conducted training has the advantages of minimal transport and accommodation costs for trainees and training adapted totally to local needs.
31. If the training is organized regionally these advantages are diminished but expenditure is at least retained within the regional economy and training remains adapted to generally similar local conditions. On the other hand, there are advantages in that a regional approach can spread the costs of preparing and conducting training over many more trainees, improve the quality of both activities, and increase the amount of training available. In addition, regional co-operation leads to a useful exchange of experience between personnel from different countries.
32. Actions required start with the identification of training needs of all maritime sectors in the region. The effort required to produce adequate training can then be assessed and a decision taken whether this should be through central or local effort. In either case, training standards will need to be agreed jointly among all concerned, and staff selected to receive instruction in training methods. Then the region will be ready to go ahead with a co-ordinated training programme.
33. In general, the most favourable approach is for each country to undertake its own basic training, but for all countries to support a regional centre which would adapt or develop training of general applicability and interest. Such training would be conducted at the centre or at local institutions according to the number of trainees concerned and special facilities required. The centre would also be able to co-operate with centres in other regions, to exchange experience and course materials for adaptation.
34. UNCTAD has assisted numerous organizations through various training activities through its technical assistance projects such as TRAINMAR and IPP.[7] Activities have included the organization and running of training courses, seminars and workshops, the production of training materials, the advice on establishing and operating a training centre, and the identification of training needs.[8]
35. Of particular interest within the framework of co-operation among developing countries is the UNCTAD/UNDP TRAINMAR programme. One objective of TRAINMAR is to develop a network among maritime training institutes of developing countries so that a system of exchange of training material and instructors, trainees and cost sharing is established among associated TRAINMAR training centres. Regional co-operation is also promoted in course development, delivery and course adaptation. In September 1985, there were 14 TRAINMAR centres offering courses in port management – 5 in Asia, 6 in Africa and 3 in Latin America.
36. The future five-year plan for the TRAINMAR project is to increase the number of port training centres and to organize these centres in technically and financially self-supporting regional networks. This will require the participating countries to continue to provide inputs from their own resources and to continue to co-operate at the regional level.

G. Other areas of co-operation

37. Port authorities in a region may decide to establish a *regional research centre.* While such a centre may not be feasible for a single country, it may become viable for a group of countries. The centre could be financed by contributions from the various port organizations in the region, such as port authorities and cargo handling companies. As part of their contribution, these organizations may second qualified staff to the centre for a fixed period. The centre would probably best evolve from an existing department in a port or from an national research centre which may have a broader mandate, such as transport or management. The centre could maintain a library of technical publications and copies of all port related studies carried out in the region. Further, a summary of technical publications, studies and port related articles could be prepared and circulated to ports in the region. Research could be carried out on many topics, for example, port institutional structures, optimum organization for local conditions, liability and possible joint insurance coverage, manpower planning for containerization, design and materials for tropical conditions, equipment requirements and modular transit sheds. The experience and qualifications of staff in the centre would allow them to undertake consultancy assignments in the region. The centre would also act as a catalyst for other areas of regional co-operation. The merging of regional research and training centres would have merit as both activities would be complimentary and would make the combined centre more effective.
38. An expensive piece of equipment can remain out of use for extended period because of a lack of a relatively inexpensive spare part. Lengthy delivery times from the supplier and time consuming procedures to release foreign exchange are often reasons for the long delay. One method of reducing this downtime would be an arrangement between ports in the region whereby, in an emergency, a spare part from another port could be used and would subsequently be paid back either in kind or in funds. In order for the *spare parts exchange pool* to work, good communication is required to locate the required part and a rapid payback of loans is necessary to assure continuing co-operation.
39. The selection of appropriate cargo handling equipment is one of the most important decisions port management must make. Often there is a lack of quantified information as either appropriate records have not been kept or this is the first time a particular piece of equipment has been required for the port. The existance of an *information exchange on operating, maintenance and financial data on port equipment* would be most useful. Such information could be maintained by the regional research centre mentioned previously. The information exchange would also act as an incentive to port managers to maintain appropriate records on the operation and maintenance of equipment. Port management associations should be encouraged to promote the exchange of information between member ports of their experiences of different makes of operating equipment. This information would be very useful as working conditions are often similar. When the port authority is not directly involved in cargo handling, the cargo handling company would need to be associated with the exchange. A standard format for the exchange of information is given in annex III.
40. Advances in the physical movements of goods have not been matched by the capacity for handling the associated information and there is a clear need for *trade facilitation.* There is an International Convention on the simplification and harmonization of Customs procedures, the "Kyoto Convention". The Convention proposes model procedures for world wide application which have to be adapted to national needs and adopted by national legislation. In particular, annexes B.1 and C.1 of the Convention contains many standards and recommended practices which would facilitate the import or export of merchandise. The Customs Co-operation Council prepared this Convention in an attempt to encourage all member countries to promote the simplification and harmonization of Customs procedures as extensively as possible. Responsible officials of port authorities in a region could work together with Customs, shippers and shipping operators to implement the procedures of the Kyoto Convention. The United Nations standard layout of information on a standard size of paper greatly reduces errors, improves document handling and helps to identify particular items. The port authority is often the natural agency to establish and maintain arrangements for facilitation discussions, negotiations and monitoring. The establishment of regional and sub-regional consultative groups to meet on a regular basis would encourage trade facilitation which would be a great benefit to world trade and the transport community.
41. Port authorities are becoming more aware of their responsibility in protecting the marine environment. Regional co-operation in *pollution control* would assist port authorities in carrying out this role. To establish an environmental data base of the existing levels of pollution, sampling and measurement with an inter-calibration of analytical techniques would allow a regional exchange of information through the regional research centres. The main cause of pollution will probably be crude and refined oil which will come from tanker accidents, deballasting operations and tank washing, refinery effluents, municipal and industrial discharges, losses from pipelines and offshore production. Regional co-operation in combating pollution emergencies caused by accidental spills could take the form of sharing resources such as dispersants and vessels specially constructed for collecting oil spills.
42. There is a trend to increased foreign investment in cargo handling equipment in ports. Shipping lines are often involved in purchasing equipment that is left in the custody of their agents or the port authority with the understanding that the shipping line would have priority use. This involvement of the users in supplying container handling equipment to port authorities in developing countries would be a method

of North-South co-operation. The advantage to the developing country is a considerable reduction of capital expenditure and for the user, a rapid turn-around of ships at the terminal. The arrangement would also commit the user to the terminal, thus limiting the risk to the terminal of the service being withdrawn. There is a need for Governments to consider developing *guidelines for foreign participation* which should cover such topics as operating rights and responsibilities, financial and legal liabilities, maintenance, and needs of other terminal users. Guidelines could be drafted through the regional port research centres or regional port management associations.

43. Another area for possible port co-operation would be *equipment recycling.* Port authorities or operating companies may find that well maintained equipment is no longer required because of changes in traffic or must be replaced by higher capacity equipment. This second-hand equipment could be sold to other ports. This would considerably reduce the capital outlay required compared to the purchase of new equipment. The regional port associations may serve as an initial contact for ports with such equipment and could subsequently inform their members of its availability. Arrangements for payment and transport would have to be negotiated as would arrangements for training in operations and maintenance of the equipment.
44. An example of co-operation between ports (mostly North/South but occasionally South/South) is provided by the *sister port scheme* established by the International Association of Ports and Harbors in 1979. The scheme has the objective of bringing together ports able to offer assistance in training and expertise with those ports requesting such facilities. A questionnaire was circulated to donor and recipient ports to identify those interested. The number of positive replies from developing ports indicates that there is a need for relations in various forms with more advanced ports. There was a positive response from a large number of potential donor ports, although an equal number had replied negatively with reasons ranging from a shortage of staff and funds, limitations through government policy and following their own policy in this field. IAPH has acted as a clearing house to establish contact between port pairs. The scheme has resulted in the secondment of experts to the less developed port and the training of staff of that port both on-the-job and in the more developed port. The UNCTAD secretariat considers the scheme to have particular merit and port authorities from both developing and developed countries should be encouraged to associate actively in this scheme. Staff exchanges and training schemes which could be arranged, would greatly benefit officials from developing ports.

II. SUMMARY AND CONCLUSIONS

45. There are many areas where co-operation between ports would appear to be beneficial. Experience, however, has shown that external assistance is often required to obtain concrete results as port authorities from developing countries often lack financial resources.
46. Co-operation will be successful only when there is a common, and often economic, benefit for the association of organizations. The co-operation will involve joint inputs in the selected field and a sharing of the results.
47. The possibility of technical co-operation between ports in developing countries is part of the programme of action for technical co-operation between developing countries in shipping. This is a recognition that developing countries can help one another. Although the provision of technical assistance can be undertaken by developing countries, there is a need for funding from developed countries.
48. Co-operation will be successful if there is support at a high political level. In addition, organizational and administrative skills, good communication and appropriate resources are required.
49. In connection with transhipment ports, the UNCTAD secretariat, in co-operation with the regional economic commissions, would be an unbiased organization to carry out an economic evaluation of the alternative sites.
50. The UNCTAD secretariat is ready to continue to provide support, within available resources, to the various regional port management associations, regional training centres and, if the idea is taken up, regional research centres.

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[1] ECE/AC.14/R.19
[2] TD/B/C.4/273
[3] For a more detailed treatment of transhipment see, Transhipment Ports; (TD/B/C.4/293)
[4] "Topping-off in Delaware Bay", Bulk Systems International, October 1985
[5] Manual on a uniform system of port statistics and performance indicators; UNCTAD/SHIP/185/Rev. 1.
[6] UNCTAD Monographs on Port Management; UNCTAD/SHIP/494
[7] The UNCTAD/UNDP TRAINMAR project for training in the field of maritime transport and the UNCTAD/SIDA programme for Improving Port Performance (IPP).
[8] See Port Management Training – UNCTAD's approach; TD/B/C.4/AC.7/3

UNCTAD Publications on Ports

(Extracts from UNCTAD documents: TD/B/C.4/AC.7/2)

TD/B/C.4/23* Development of ports: progress report by the UNCTAD secretariat.

This first progress report on this subject describes the objectives and methodology of UNCTAD's ports research. It includes on annotated bibliography of published material on ports (as available in 1966).

TD/B/C.4/42 & Rev. 1* Development of Ports and Improvement of Port Operations and Connected Facilities

Develops a number of analytical tools including simulation and optimization models in an attempt to solve the problem of when and how to invest in port development.

Part one: The problem of port development
Part two: Simulation of port operations
Part three: Optimization of port development
Part four: A test case; Casablanca.

TD/B/C.4/75* Unitization of Cargo
Part Five of this document, entitled "The Impact of Unitization on Berth Requirements in Developing Countries", examines the differing requirements in terms of numbers of berths, capital, land and labour of the different forms of cargo unitization.

TD/B/C.4/79 Port Statistics: Selection, Collection and Presentation of Port Information and Statistics United Nations publication, Sales No. E.72.II.D.1
Sophisticated methods of analysis require reliable data: indeed, so does the efficient management of a port. This manual provides guidance to port authorities on the information needed for efficient port planning and management.

TD/B/C.4/83* General Report on Dredging
This is a technical report analysing the dredging problems of ports and examining the types of dredging equipment available. Costs are compared for different dredging equipment and the report concludes with a discussion of the organization of dredging operations in developing countries.

TD/B/C.4/109 + Add. 1 Berth Throughput and Systematic Methods of Improving General Cargo Operations United Nations publication, Sales No. E.74.II.D.1.
Describes a methodology for identifying the bottlenecks preventing higher berth throughputs and assessing the benefits to be derived from the elimination of such bottlenecks.

TD/B/C.4/110 Rev. 1 Port Pricing United Nations Publication, Sales No. E.75.II.D7.
Surveys existing systems of pricing of port facilities and services and, against the background of a discussion of the objectives of a port authority, makes proposals for the improvement of the pricing system.

TD/B/C.4/129* Technological Change in Shipping and its Effects on Ports
Shows the impact on ports in developing countries of the various technological changes which are occurring in shipping.

TD/B/C.4/129 Supp. 1* The Imapct of Unitization on Port Operations
Examines the impact of the various forms of unitization on berth requirements and operating practices in developing countries.

TD/B/C.4/129 Supp. 2* Cost Comparisons between Breakbulk and various types of Unit Load
Updates calculations appearing in Part Five of document TD/B/C.4/75 showing the port handling costs for various types of unitized cargo.

TD/B/C.4/129 Supp. 3* Selection, Collection and Presentation of Statistical Informations concerning Container and Barge Operations in Ports
Proposes methods of collecting specific information for container and barge traffics to supplement the data collection presented in document TD/B/C.4/79: Port Statistics.

TD/B/C.4/129 Supp. 4* Establishing Tariffs for Unit Load and Multi-purpose Terminals
Discusses specific pricing issues related to the use of new terminals for unit load traffic or multi-purpose terminals.

TD/B/C.4/129 Supp. 5* The Impact of Technological Developments in Bulk Traffics on Port Facilities
Discusses the land penetration of sea-borne trade through sea-going barges and barge-carrying vessels.

TD/B/C.4/129 Supp. 6* Current developments in Sea-going barges and Barge-carrying Vessels
Discusses the way cargo is handled at some of the more advanced port terminals for liquid, solid bulk and liquefied natural gas.

TD/B/C.4/130 & Supp. 1 Port Congestion Surcharges: Policy Issues
Port congestion surcharges became more frequent in the early to mid 1970s. This report discusses the efficacy and reasonableness of congestion surcharges. It draws attention to some of the problems which limit their fairness and effectiveness.

TD/B/C.4/131 & Supp. 1 Port Performance Indicators United Nations publication, Sales No. E.76.II.D.7
Shows the importance of developing indicators as a check on port performance and discusses the construction and use of the most useful indicators.

TD/B/C.4/132 Application of Systems Analysis to Port Planning
Examines the conditions necessary for the use of systems analysis in ports and discusses the extent to which these conditions are met in most developing country ports.

TD/B/C.4/142 Port Congestion
A short note drawing attention to the growing extent of port congestion particularly in the developing countries.

TD/B/C.4/152 Port Congestion; Report of the Group of Experts
Examines the extent of port congestion in 1975 and the early part of 1976. Suggests short-term measures which can be taken both within and outside the port to reduce or eliminate congestion together with the longer term measures needed to prevent its reappearance.

TD/B/C.4/166 Benefits accruing from Port Improvements
Outlines some methods for adapting liner freight rates and port charges in order that the benefits from port improvements which accrue to shipping lines can be shared with the countries concerned.

TD/B/C.4/167 Causes of Increases in Port Costs and their Impact
Identifies and analyses the causes of port cost increases and their impact on the foreign trade, balance of payments, freight rates and overall transport costs of developing countries.

TD/B/C.4/167 Supp. 1 The Extent and Causes of Port Cost Increases
Assesses the extent of port cost increases both for services to the vessel and to the cargo. Analyses the main causes

such as increases in labour costs, capital equipment costs, etc.

TD/B/C.4/174 Appraisal of Port Investments
A report in two parts. The first part discusses the concepts of both financial and economic costs and benefits and methods of comparing them. The second part illustrates the use of the various methods through a series of case studies.

TD/B/C.4/175 Rev. 1 Port Development: A Handbook for Planners in Developing Countries United Nations publication, Sales No. E.84.II.D.1
A reference book describing the basic principles of modern port planning. It provides guidance in the task of formulating a national port development policy and of preparing realistic programmes for the extension and improvement of individual ports.

UNCTAD/INV/523 Manual on Port Management
Consists of summaries of lectures presented at the Fouth UNCTAD/SIDA Training Course in Port Management.
Part One: Transport Economics and Port Administration
Part Two: Port Planning
Part Three: Port Operations
Part Four: Modern Management Techniques

UNCTAD/SHIP/138 Financial Management of Ports
Provides port management with a better understanding of the accounting and financial functions of a port. The first part is a step-by-step introduction to the subject for non-accountants. The second part covers the analysis of financial statements, cost control, budgeting and ways of improving the financial situation.

UNCTAD/SHIP/184 Proceedings of the UNCTAD/ECA Seminar on Port Operations, Odessa (USSR) August 1978
Consists of summaries of the lectures and workshops presented during this UNDP financed seminar.

UNCTAD/SHIP/185 Rev. 1 Manual on a Uniform System of Port Statistics and Performance Indicators
Originally developed to allow the harmonization of port statistics in West and Central African Ports, this manual can be of general use in making operational statistical information more uniform and in presenting common performance indicators.

TD/B/C.4/192 A Summary of the Work carried out under the Ports Project, 1971–1979, and New Project Proposals
Describes and attempts to evaluate how the work carried out under the Ports Project Trust Fund has contributed to the improvement of port efficiency in the developing countries.

TD/B/C.4/193 Manual on a Uniform System of Port Statistics and Performance Indicators developed for the Port Management Association of West and Central Africa
Summarizes the main features and coverage of the system described in document UNCTAD/SHIP/185 Rev. 1.

TD/B/C.4/199 Action taken with respect to Port Congestion Task Forces
Evaluates the results achieved by a team of experts fielded by UNCTAD to help combat port congestion in certain developing countries requesting them.

TD/B/C.4/202 The Rationalization of Port Congestion Surcharges
Describes and evaluates schemes to rationalize the practice in liner shipping of applying port congestion surcharges.

TD/B/C.4/246 Action taken to implement resolution 35 (IX) of the Committee on Shipping
Describes the work undertaken by the secretariat to:
- establish a port data bank
- set up an advisory service for the implementation of UNCTAD's port studies
- prepare, in collaboration with the International Association of Ports and Harbors, a series of monographs on port management.

TD/B/C.4/247 Port Congestion Surcharges: Follow-up
Describes progress made towards the rationalization of port congestion surcharges.

TD/B/C.4/248 Ports and Economic Development: Policy Issues
Alerts Governments to the dangers of neglecting port development and draws attention to the economic benefits of taking positive steps to improve port efficiency.

TD/B/C.4/272 Port Data Bank
Presents the results of a pilot study to establish a bank of information on container terminals.

TD/B/C.4/277 Implementation of Resolution 35 (IX) of the Committee on Shipping and of the UNCTAD/SIDA Project on Improving Port Performance
Describes the work undertaken by the secretariat to:
- operate an advisory service for the implementation of UNCTAD's port studies
- prepare a series of monographs on port management
- prepare training materials for a course entitled "Management of General Cargo Operations" and to train local instructors on how to conduct this course in their own countries.

TD/B/C.4/279 Port Congestion Surcharges: Underlying Principles
Describes further work on the subject of port congestion surcharges and discusses the principles which should underlie their imposition.

TD/B/C.4/280 Outlines of the studies on Port Financing, Bulk Terminals and Trans-shipment
Provides outlines of the three port studies requested by the Conference at its Sixth Session in Belgrade.

TD/B/C.4/AC.7/2 A Summary of UNCTAD's work in Ports
Describes and attempts to evaluate the work carried out by the secretariat over the past 20 years in the field of ports.

TD/B/C.4/AC.7/3 UNCTAD's Approach to Port Management Training
Describes the secretariat's work in port management training over the past 15 years. Discusses the results being achieved from two important training projects: Improving Port Performance (IPP) and TRAINMAR.

TD/B/C.4/AC.7/4 Co-operation between ports
Describes areas where inter-port co-operation could be of benefit to the ports industry.

TD/B/C.4/291 Port Financing
Investigates the availability of financial resources, the conditions of financing and the modalities of foreign investments in ports.

TD/B/C.4/292 Bulk Terminals
Discusses the development and operation of terminals for the loading and discharge of the major bulk commodities.

TD/B/C.4/293 Transhipment Ports
Discusses the trend towards a greater degree of transhipment, particularly in container trades, and examines the choices facing Governments and port authorities in developing countries in the light of this development.

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*: Early documents marked with an asterisk (*) are only available on microfiche.

'International Bulk Congress 1986' to be held in Rotterdam, 23–25 September

"Among the difficulties faced by the international dry bulk industry the most prominent include political and economic growth constraints; imbalance of raw materials supply/demand; changing trade patterns; massive overtonnage in the shipping sector; over capacity in port/terminal availability and subsequent capital investments restraint.

Focussing upon the market realities, INTERNATIONAL BULK CONGRESS 1986 will take as its theme the fact that in responding to uncertainties in the market today the industry worldwide is seeking greater business security, improved competitiveness, and the ability to capitalise on opportunities through greater efficiency and innovation in all sectors.

Confirmed speakers already include the Executive Director of the International Energy Agency, Mrs. H. Steeg; Board Director of Thyssen Stahl FRG, H. Wilps; as well as senior officials from the governments of The Peoples Republic of China and the Netherlands.

Major business sessions at the three day event will examine current market conditions, innovative developments in bulk shipping, emergent trade opportunities and the impact of market trends upon port design, development, operation and marketing.

For full details of the business and extensive social programmes of International Bulk Congress 1986 please contact the Conference Manager, International Bulk Journal, Ranmore House, Ranmore Road, Dorking, Surrey, RH4 1HE, England. Telephone: (0306)-887433. Telex: 859597 IBJASS G."

Operations begin at new Port of Quebec general cargo facility

A new 11,200 square meter general cargo shed has been brought into operation at the Port of Quebec's Estuary Sector with the reception of newsprint produced in Quebec City and destined for export. The $4 million investment represents the first phase in the development of a new multi-user terminal, which will enable the Port of Quebec to better serve shippers of general cargo.

Demolition of old "shed 27", an outdated 4,000 square meter structure built in 1936, was carried out in the fall of 1985. The new shed is designed to meet modern cargo handling requirements.

While the building is not heated, its cement block walls provide improved insulation. Better natural lighting has been obtained through two rows of windows installed in the roof.

In addition to providing 7,000 more square meters of storage space than its predecessor, the new structure is located closer to dockside, facilitating winter operations. It also offers improved access for trucks. Berthing space for access to the shed is situated on the St. Charles River Estuary on the North Pier, east of the Bunge of Canada operated grain elevator. The site is sheltered from stronger currents in the St. Lawrence River.

The port is planning a series of improvements to upgrade the entire infrastructure of the North Pier, first developed in the early 1900's. The program will provide 20,000 square meters of additional open-air storage space for a multi-user terminal equipped with modern and efficient sheds, serviced by road and the CN/CP railways, and capable of simultaneously receiving five vessels.

Privatizing CAORF: MarAd

In keeping with the Reagan Administration's policy of transferring the operation of research facilities to the private sector, the Maritime Administration (MarAd) plans to offer for "privatization" its Computer Aided Operations Research Facility (CAORF). MarAd is seeking parties interested in the private operation of this research facility located on the grounds of the U.S. Merchant Marine Academy at Kings Point, New York. The facility would become available in fiscal 1987. Transition to private interests as early as possible during fiscal 1987 is desired.

CAORF contains one of the world's most sophisticated ship maneuvering research simulators dedicated exclusively to solving maritime problems. The CAORF simulator realistically simulates vessel operations in port or at sea in real time, using a full scale mockup of a ship's bridge and a full-color image projected on a 60-foot diameter screen that provides 240 degrees of visibility. A wide variety of safety-related problems can be studied, including ship control and navigation, bridge layout, collision avoidance procedures, equipment design, and harbor and restricted waterways design (including the placement of navigational aids).

Major funding sources for current work at CAORF are the U.S. Army Corps of Engineers, the U.S. Naval Training Systems Center, the Navy's Strategic Systems Programs Office, the Panama Canal Commission, MarAd,

and some private vessel operating companies. It is MarAd's intention to maintain the continuity of CAORF operations in such a way as to minimize disruption to client research programs.

While plans are not detailed, MarAd contemplates entering into a contract/cooperative agreement or some other suitable type of arrangement for the operation and maintenance of the facility as a private venture. Sale of some or all of the existing equipment could also be part of this arrangement. Continuation of CAORF as a leader in shiphandling simulation over the long term will be an important consideration. *(AAPA Advisory)*

45 ft. project nears completion: Port of Corpus Christi

Phase One of the Port of Corpus Christi's inner harbor deepening project continues digging toward a March 1986 completion date.

As of Dec. 3, Phase One of the three-part project was 60 percent completed, according to Robert E. Beggs, area engineer for the U.S. Corps of Engineers.

Beggs says the entire 10-mile deepening project should be completed in early 1988. At that time, the depth of the entire 39.9-mile channel will be 45 feet, making the Port of Corpus Christi the deepest along the Gulf Coast.

Port officials say the five-foot deepening of the inner harbor will allow ships to load more cargo and provide the Port Authority with better incentives in attracting business.

Much of the port's income is based on wharfage fees, which are determined by the number of tons of material loaded. With ships loading more, the port can draw more income. The additional loading capability also will mean more profit to shipping companies, port officials say.

(Port Progress)

Bill Beck elected President: Seaway Port Authority of Duluth

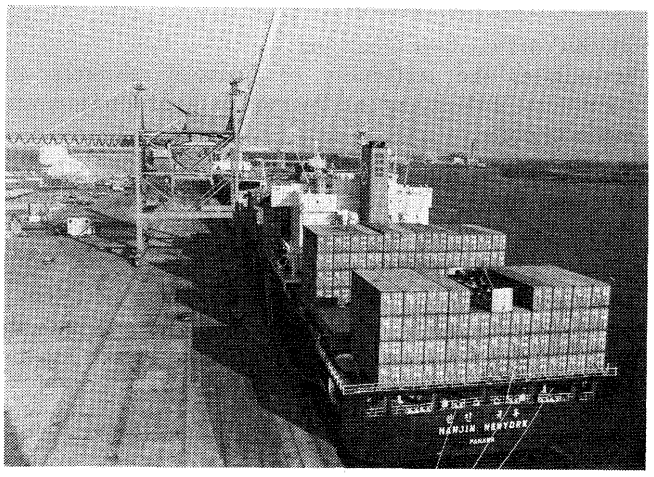
Duluth writer and historian Bill Beck has been elected president of the Seaway Port Authority of Duluth.

Beck, appointed to the Port Authority Board of Commissioners by the Duluth City Council in December 1982, will succeed Russel G. Schwandt, Sanborn, Minn. Schwandt, one of two gubernatorial appointees to the board, has served as president for the past two years.

The appointment becomes effective April 1, the start of the Port Authority's fiscal year.

Jerry Janezich, St. Louis County commissioner from Hibbing, Minn., was elected Port Authority vice president. Other officers, all from Duluth, are Albert P. Colalillo, secretary; Ingrid Wells, treasurer, and Donald W. Ireland, assistant treasurer.

Hanjin launches Savannah service



Hanjin Container Lines has launched a new all water service between the Far East and the U.S. East Coast, naming Savannah as its only South Atlantic port of call.

The South Korea based line will operate a six-ship fleet of newly built vessels, each offering a 2,668 TEU capacity and 22 knot cruising speed. The first of these, the Hanjin New York, inaugurated the service.

The Hanjin New York and her sister ships, the Hanjin Hong Kong, Keelung, Long Beach, Yokohama and Kobe will bring the line's fleet up to 13. These five remaining vessels are scheduled to be in service by late September of this year. A 10-day rotation will commence once all the ships are in use.

Ports of call will be Hong Kong, Keelung, Busan, Kobe, Yokohama, Long Beach, Savannah and New York. The vessels will travel the Panama Canal both inbound and outbound.

Handling rates, wharfage fees on certain commodities reduced at Port of Houston Authority facilities

Reductions in handling rates for non-fat dry milk and wharfage fees for rice and rice products have been approved by the Port Commission of the Port of Houston Authority (PHA). In addition, the Commissioners authorized a reduction in wharfage fees for ores.

Rates charged by private freight handlers will drop nearly 64 percent for non-fat dried milk in bags. Wharfage fees assessed by the Port of Houston Authority for bagged rice and packaged rice products have been reduced by one-third, while such fees for ore have been cut by nearly 12 percent.

"These reductions were effective March 10," noted Richard P. Leach, executive director, PHA. "The products affected by these tariff changes are price sensitive, and the competition to attract them is intense."

"Although these costs represent only a small portion of the total transportation costs a shipper incurs, they illustrate the Port Authority's continuing commitment to maintaining its competitive edge," he added.

Handling and wharfage rates for most bagged agricultural goods at PHA facilities were reduced earlier this year.

New yard cranes added at intermodal facility: Port of Houston

Barbours Cut Terminal has expanded its crane capability, adding two new yard cranes to better serve vessels and help further reduce the terminal's already excellent turnaround time for trucks.

The two Peiner-Koch cranes are scheduled to go into service at the Port of Houston Authority's container terminal this month. The new cranes bring the total number of yard cranes at the terminal to 11. Eight wharf cranes also serve the facility.

Each of the new cranes has a 30-ton capacity and can stack containers five high.

The added cranes are expected to reduce turn-around time for trucks using the terminal to about 45 minutes, according to John Horan, manager of Barbours Cut. Prior to the arrival of the new cranes, a driver with proper papers could bring in a load and be on his way with another load in about 55 minutes.

Barbours Cut, the most modern intermodal terminal on the Gulf Coast, serviced 650 vessels in 1985 and handled 275,000 teus. *(Port of Houston)*

Historic 150,000th container load at Matson Container Terminal: Port of Los Angeles

Los Angeles Harbor's Matson Container Terminal has handled this historic 150,000th container load of Nissan automotive parts. A milestone in international commerce between Japan and the U.S. West Coast, this container, shipped aboard the Hira Maru, represented an estimate total of 2.25 million tons of auto parts shipped from the Kawasaki, Japan, factory to the United States. Sharing in this special moment are, left, James Ross, general manager, and Jeannie Febuary, Terminal Equipment Supervisor, Showa Maritime USA Inc., and Larry Rochelle, vice president, Express Intermodal Transport.

Marine Safety Program begins: Maryland Port Administration

A new voluntary program to predict hazards and identify causes of marine accidents, particularly when human error is involved, has been initiated at Baltimore and other ports nationwide by the U.S. Department of Transportation (DOT).

The program is called the Marine Safety Reporting Program (MSRP) and is being managed by DOT's Transportation Systems Center (TSC) located in Cambridge, Massachusetts. Researchers at Battelle Memorial Institute's Columbus Laboratories are providing report and data analysis under contract with TSC.

In the one-year demonstration project, now in its sixth month, shipboard operating personnel and others who are informed about vessel performance are invited to submit reports describing potential unsafe situations or near-accidents, how they developed, how they were detected, and the measures taken to manage the risk involved. Persons reporting such incidents are guaranteed anonymity.

Underlying the project is the assumption that by combining the maritime industry's keen interest in safety with a program of voluntary, confidential incident reporting, a great deal of information can be collected, analyzed, and distributed to all interested parties.

The project encompasses all types of safety-related incidents, problems, or conditions. Included are ship handling, aids to navigation, weather reporting, equipment performance, ship-to-ship communications, chart accuracy, and other factors affecting vessel navigation and control.

(Port of Baltimore)

MPA leasing strategy geared to boosting Port business

The Maryland Port Administration's strategy of signing steamship lines to long-term leases is designed to solidify Baltimore's cargo base while providing incentives for greater volumes of business.

"We believe that the lease agreements will lower costs for vessel operators using the Port of Baltimore and furnish them with powerful incentives to increase their utilization of MPA facilities," said Acting Port Administrator David A. Wagner.

The latest lease agreement provides for Atlantic Container Line to make at least 100 vessel calls to Baltimore and ship at least 400,000 tons of cargo through the port for each of the next three years.

"We now have commitments for 700,000 tons of cargo and 200 vessels calls for each of the next three years," added Edward G. Ryznar, associate port administrator for trade and promotion. "Those are the kinds of numbers that show why Baltimore is the No. 1 port in the Mid-Atlantic range."

According to Mr. Ryznar, "Our goal is to cement our relationship with our customers. At the same time, we are showing them that it will be well worth their while to bring new business here."

Lost work days decrease at MPA terminal facilities

Lost work days due to accidents at Maryland Port Administration terminal facilities in Baltimore dropped 28 percent in 1985 over the 1984 level, the Maryland Port Administration reports.

Wayne Huller, the MPA's director of terminal operations, said the 1985 safety statistics helps the port's competitiveness. "This shows a greater care on the part of our workers, and has certainly paid off in terms of increased productivity," Huller said.

A total of 585 days were lost due to accidents in 1985 compared to 801 lost work days in 1984.

Just 127 accidents occurred at the Dundalk and North/South Locust Point marine terminals, the port's MPA-owned facilities, in 1985. Of these, only 42 were classified as "lost time" accidents.

In addition, 1985 marked the first time in nine years that no MPA employee suffered three or more lost time injuries in one year, the MPA says.

Port of New Orleans initiates strategic plan study

The Board of Commissioners of the Port of New Orleans has embarked on a strategic study described by Board President Lucien J. Gunter as "the most important planning process ever undertaken in the history of the Port."

Gunter said only one other port in the United States has ever conducted such a comprehensive strategic plan, and Louisianians should be proud that their port is maintaining its leadership role in planning for the future. The board and staff have been working for almost a year to lay the base for the strategic plan to restore the Port's position in the maritime industry.

"The commissioners and staff believe that the strategic plan will provide the Port with the vehicle to revitalize the Port of New Orleans and give us a road map for greater accomplishments for this metropolitan area and the State of Louisiana."

The contract was awarded to Temple, Barker & Sloane, international management and economic consulting firm, based in Lexington, Mass., and joint venture partner Cocchiara and Renner, a New Orleans-based economic and planning consultant.

Commissioner Donald R. Mintz said the study will define the port's mission and roles, establish goals and objectives, and develop strategies and courses of action to achieve the Port's missions through the year 2000.

Mintz, the board member designated to work with the staff on this new initiative, stated that he feels that Temple, Barker & Sloane and Cocchiara and Renner, and their subcontractors represent an outstanding team selected from among the best firms in the nation that were considered for the project.

The planning process will include an evaluation of commodities expected to move through the Port to the year 2000; an assessment of the Port's wharves, equipment and other facilities; organizational and management analysis; an evaluation of real estate usage of downtown riverfront property and future surplus land; and any required repositioning to meet the Port's objectives.

The contract calls for the project to start immediately and will be completed in November at a cost of $310,000. As phases are finished during the project, reports and recommendations will be made to the Port for immediate action, if required.

The final plan will define critical strategic issues, identify options, develop options, and recommend decisions and further action plans.

The Board of Commissioners has requested participation of a citizens' advisory committee to work with it, the staff and the consultants in reviewing the strategic planning periodically. The committee is composed of a cross section of community leaders, representing various maritime and nonmaritime interests.

Henry G. Joffray, acting port director, said that the decision to undertake this project was jointly arrived at by the Port staff and the commissioners after a series of meetings late last summer and early last fall.

(Port Record)

Another record-breaking year for the Port of New York & New Jersey

Oceanborne general cargo moving through the Port of New York–New Jersey reached a record 13.7 million long tons for 1985, up 5.1 percent over the preceding year, Port Authority Chairman Philip D. Kaltenbacher announced recently. The Port outperformed the North Atlantic Ports as a whole and showed a greater rate of increase than the ports of the United States collectively.

The increase for the New York–New Jersey Port compares with gains of 3.9 percent for the North Atlantic Ports and 3.7 percent for all United States ports. "As a result," Chairman Kaltenbacher noted, "our port's share of North Atlantic oceanborne general cargo trade rose to 46 percent and its United States share climbed to 10.7 percent, the highest percentage of this decade.

"While we are pleased with the record volume," the Chairman explained, "we are disappointed that inbound tonnage accounted for 80.5 percent of our general cargo while outbound movements were only 19.5 percent – the greatest imbalance between imports and exports in the history of this port."

In the annual analysis of foreign trade in the bi-state Port released today, Chairman Kaltenbacher further noted the New York–New Jersey Port handled a total of 51.3 million long tons of oceanborne foreign trade, general cargo and bulk, valued at $48.8 billion. Of this total, $41.2 billion represented high value general cargo, an increase over the $40.9 billion value in 1984.

New forecasting system to aid ships: Port of Portland

A unique river gauging system on the Columbia River will eventually allow ships to be more heavily loaded in Portland.

The deepening of the Columbia River bar from 48 to 55 feet in 1984 set the scene to make the Columbia's 40-foot

navigational channel more efficient and better utilized.

The River Level Reporting and Forecasting System is a planning tool for helping pilots and captains confidently maximize their cargoes out of Portland, says David Neset, Marine Services director for the Port of Portland. The new system provides information on river stages and tidal influences.

Pilots and captains see river depth as important information for timing their sailings and loading their vessels. Presently, during low-water periods in the fall, they are sometimes loading lighter than necessary, which could result in revenue loss from not fully utilizing vessel capacity.

The Columbia River channel depth is currently 40 feet, but the depth of available water is constantly changing because of freshwater flow from the Columbia, Willamette, Sandy, Kalama, Lewis and Washougal rivers, which vary due to snowmelt, rainfall and hydroelectric dam operation, coupled with the tides from the ocean, which are constantly fluctuating.

"We get the freshwater flow from Bonneville Dam in one direction, and the effects of the ocean tides from the other end – this varies from hour-to-hour and at different points along the river," says Neset.

Don Grigg, manager of market development for the Port, explains further, "The stages of the river make planning difficult for the steamship companies. They need to know the best time to sail and what the water depth is going to be along the way."

The Columbia River has a hydraulic cycle that peaks during early summer due to snowmelt runoff from the Cascade Range and the tributary rivers in Canada and in the United States. The river normally peaks sometime in May or June. The forecasting system will be of greatest use during the fall harvest months, when the river is at its lowest level.

The Port of Portland retained Ogden Beeman and Associates to develop a computerized "dynamic wave model" that will give ship operators important planning information. This will allow better load planning, thus fully utilizing the 40-foot channel.

There are seven gauges on the river that show the amount of water depth above the zero river stage reference line, which can be added to the 40 feet of depth dredged below the reference line.

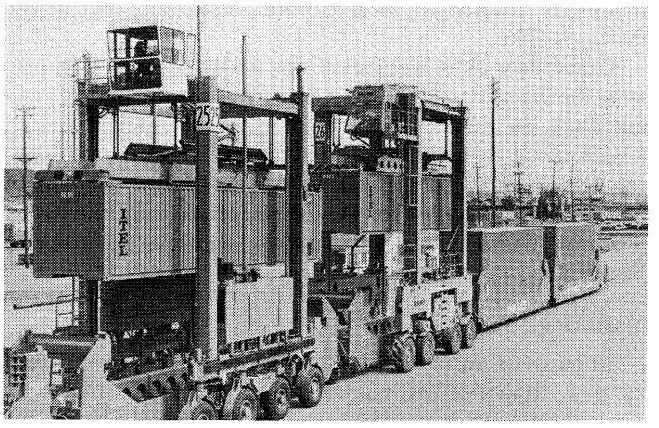
The idea behind the river level predictive model is to establish what the river is in actuality, and then, predict it for the future by computer. Relevant information is fed into a computer: channel depth, tides, freshwater flows, etc. The computer then manipulates all the data, giving a prediction of the river stages, to be used as a tool to aid the ship's captain in loading his vessel.

The seven gauges along the river would aid in the prediction of the river height at each of the seven points during the transit of the river. By knowing the minimum predicted height along the way, the pilot or captain would have an idea of what his minimum water depth would be. For example, if we have a 40-foot channel, and the minimum height experienced along the way is three feet, then the captain could assume that he had basically a 43-foot channel to work with and could load his ship accordingly.

How does all this information affect revenues? For example, if a grain ship can load a foot deeper than it normally would, that foot of draft equals 2,000 tons. With current rates at $10 a ton, that represents roughly an additional $20,000 in freight revenues.

The River Level Reporting and Forecasting System has been running on a trial basis since last July. Testing will continue over the coming months, with the goal of having the system operational by May 1986. *(Portside)*

Container growth highlights Port of Tacoma's 1985 progress



Dramatic increases in container activity, ship calls, and vehicle imports were among the many highlights of cargo activity for the Port of Tacoma in 1985. The Port's container volume for 1985 totaled 505,000 TEUs (Twenty-foot Equivalent Units), a 236% increase from the 1984 total of 150,300. "This was one of the most dramatic years of growth in the history of the Port," explained John McCarthy, President of the Port of Tacoma Commission. "Tacoma has emerged as a major world class port, with a great potential for future growth."

The arrival of two major shipping lines in Tacoma, Sea-Land and Maersk Line, were major factors in the Port's increased container activity. Other major container shippers through Tacoma also increased their volumes, including: Star Shipping, EAC, Columbus, PAD, TOTE, and Hoegh Line. The Port undertook over $50 million in new terminal and intermodal yard construction to build the new Sea-Land facility, and a second dockside intermodal yard, both of which opened in May, 1985.

To continue to capitalize on its container momentum, the Port is making major investments to expand both its container handling equipment and facilities. Three new container cranes, six new straddle carriers, and an expansion of the North Intermodal Yard are all major projects planned for 1986.

Nearly 1,300 deep-draft vessels called at the Port of Tacoma facilities during 1985, an increase of nearly 300 over 1984. The Port's total tonnage was also up 15%, to a total of 9,416,000 short tons. Automobile imports were also up 20% to 148,830. General Motors began importing two new car models through the Port in 1985 – the Spectrum, built by Isuzu, and the Sprint, built by Suzuki.

Land Development

During 1985, the Port made major accomplishments by putting more of its 800 acres of available land to use. In April, the first phase of the new $15 million World Trade Center office complex was completed. The 38th such trade center in the world, the Port worked with private developers to build the project on Port land. According to McCarthy, "By utilizing the World Trade Center Association network, we plan to give the Port, the City, and the County a stronger identity in the world of trade."

In August of 1985, Mazda became the first user of the Port's 638-acre Foreign Trade Zone (FTZ) #86. The FTZ, which received expansion authorization in 1985, offers numerous advantages to importers, exporters, and manufacturers alike.

Other Port sites were used for major construction projects during 1985. The Port's graving dock, the largest graving dock on the West Coast, is currently being leased to Kiewit-Grice, to build pontoons for the I-90 Lake Washington bridge project. Parsons also leases land from the Port to build oilfield modules for use in oil recovery on the North Slope of Alaska. The Parsons project employs up to 2,500 people.

Marketing

In addition to marketing its FTZ, the Port also developed new strategies for marketing a variety of other Port services and facilities more aggressively. Taking advantage of its two intermodal yards, and daily train service, the Port introduced a new consolidation program last August, with exceptional service and rates which offered substantial savings over those being offered by other Pacific Coast gateways. The Port also restructured the rates for its Container Freight Station (CFS), and volumes at the CFS facility have grown dramatically.

While the Port continues to expand its container handling facilities, it also remains a highly diversified Port, capable of handling a variety of bulk, breakbulk, and project cargoes. Early in 1985, the Port handled its largest fruit shipment in history – 240,000 cartons of fruit for Saudi Arabia.

The Port will continue to concentrate on container growth, and expects to handle over 700,000 TEUs during 1986. With that total, the Port of Tacoma is expected to become the sixth largest container port in North America, and the 21st largest container port in the world.

Port of Antwerp updates Who's Who

The City of Antwerp and the Port of Antwerp Promotion Association patronize the "Vade-Mecum of the port of Antwerp", a publication which is most useful for the circulation of information on the port of Antwerp.

Subscribers to the quadrilingual Vade-Mecum recently received a completely updated Who's who, published as supplement No. 70 to the loose leaf system. This list of 122 pages includes data on some 1,300 port-associated companies in the Antwerp region, with their addresses, telephone, telex, VAT-numbers as well as the names of their maritime department heads. Companies are listed alphabetically as well as per branches of activities. In all some 70 different branches are given. This Who's who also contains information about the port authorities, some 40 public and semi-public services and over 100 committees, chambers, councils and associations with port-related activities.

This Vade-Mecum is, however, more than a mere list of addresses. It also gives a complete survey of all Antwerp port regulations and tariffs.

The complete work of c. 400 pages, contained in a plastic file, can be obtained from the publishing company Publitra, Brouwersvliet 33, box 4, B-2000 Antwerp.

Considerable growth for point-point trade & 40 ft. boxes; declining volume of conventional general cargo: Port of Hamburg

Containerization in ocean transport has not reached saturation by far. This is reflected clearly in the results for Germany's seaports. Hamburg, the largest German port, reports 1,158,776 boxes (TEU) in 1985, an increase of 8 per cent from the 1,073,428 TEU the previous year. The total divides into 603,471 TEU incoming and 555,305 TEU outbound.

"Twenty years ago, when the container became port reality, it was regarded as something apart, as a new type of cargo, which together with the classic general cargo and bulk cargo made up the total handled in a modern port," Klaus-Dieter Fischer, member of the board of Port of Hamburg – Marketing and Public Relations (regd. Assn.), said at a press conference in Hamburg. "This idea about container trade still prevails today to a certain extent and makes people forget that container trades in reality are nothing else but the general cargo we once had, and certainly the containers are nothing extra. Actually, only the packing and the form of transport have changed," Fischer said.

The total weight of containerized cargo handled in Hamburg was 10.775 million tons, as compared with 9.961 million tons in 1984. This was an increase of 8.2 per cent. Box cargo had a 50.9 per cent share of the total general cargo (21.172 million tons) as compared with a share of 47.1 per cent the previous year.

However, the satisfactory result is taken with a grain of salt: the volume of conventional general cargo dropped by 7 per cent, from 11.177 million tons in 1984 to 10.396 million tons last year. For the total general cargo – containers as well as conventional general cargo – there was an increase of 0.2 per cent.

In 1985, point-point container cargo increased more than pier-pier box trade: incoming, the increase was 5.5 per cent to 292,795 TEU and 7.7 per cent to 4.389 million tons by weight. Outgoing, the increase was 9.4 per cent to 333,905 TEU and by weight, the increase was 11 per cent to 5.231 million tons.

There is also a new trend toward the 40 ft. container. The number of these boxes increased 11.4 per cent to 180,439 in 1985, while the 20 ft. container with an increase of 5.1 per cent to 539,286 boxes lagged clearly behind. "At the same time, we notice that the utilization of the boxes, in both directions, has increased," Fischer

emphasized. "The increase in total weight – expressed in percent ages – was up over the increase in the number of boxes. The average of empties handled in Hamburg has remained stable at about 22 per cent."

A large portion of the boxes in Hamburg are handled at the Container Center Waltershof, where – among others – Evergreen Line calls as part of its "round-the-world-service".

Government to legislate for Estuary: Limerick Harbour

In a recent Green Paper on Transport Policy published by the Department of Communications, the Minister for Communications, Mr. Mitchell has proposed the setting up of a Shannon Ports Authority, which will take over, manage and operate the harbours at Limerick, Foynes and Kilrush, together with the smaller harbour facilities at Clarecastle, Tarbert, Saleen and Kilteery.

The legislation will also provide for the disbandment of existing harbour boards or authorities whose membership is as high as 27 and their replacement by smaller boards.

The management structure for the new Port Authority will be a two tier structure, modelled on the lines of the division of responsibilities in local authorities between executive and reserved functions.

Steps will be taken to ensure that in future, all harbour authorities review their rates and charges on a regular basis and to encourage rationalisation of rates structures.

The Transport Policy Green Paper states that the general aim will be to ensure that harbour authorities pay their way by charging economic rates and thereby producing realistic surpluses. In this way the call on the taxpayer for State assistance will diminish.

In a memorandum on the Government proposals, the Limerick Harbour Commissioners points out that it has always accepted the concept of a Shannon Ports Authority and outlined its proposals to the Minister in a submission in 1973.

The LHC believes that the main objective in establishing an SPA is to secure the formation of a broadly-based harbour authority, which would work together on a regional basis in unison and harmony, and that executive functions be defined in such a manner, that the existing staffs of any port authority involved would be encouraged to co-operate fully with the new arrangements.

The LHC state that Ministerial statements in recent years have led local and regional interests to expect legislative proposals for an SPA consisting of a two tier arrangement at board level, comprising a main board of 25/30 members together with a board of management of 7/9 members operating within the framework of the main board.

The LHC strongly maintain that their proposal for a main board consisting of 30 members is the best way forward, with a good geographical spread throughout the region working harmoniously in the best interests of the Estuary.

The LHC also strongly recommends that Foynes Harbour should not be included at the initial stage, because of the unanimous opposition of the Harbour Trustees and the members of Limerick County Council. Provision could be made to accommodate it at a future date concludes the LHC.

It is also considered that the exclusion of Foynes Harbour at the initial stage would not unduly inhibit the workings of an SPA.

The LHC stress that unlike local authorities, harbour authorities are expected to operate as commercial undertakings and would be unable to do so effectively under local authority type legislation. It is important that no further restrictive controls be introduced in future legislation. In this regard the proposed review of the need for many of the existing Ministerial controls is to be welcomed.

(Shannon Shipping News)

Target: cleaner harbour silt; Rotterdam works for a cleaner Rhine

Much has been done to purify waste water, but there is still a long way to go

In the past few years the industries, water boards and local authorities along the Rhine have invested huge sums in the purification of effluent. This has clearly had an effect, and the river has indeed become cleaner. But it is still by no means clean enough for Rotterdam. The Rhine silt which is dredged out of the Rotterdam docks contains so many pollutants that it may no longer be dumped in the sea – the place where river silt should ultimately end up.

The City of Rotterdam and the Dutch government have somehow to dispose of 10 million m^3 of polluted harbour silt every year. The temporary solutions to this problem extend to the year 2002. By then, the problem will have to have been definitively solved by a drastic reduction in the pollution of the Rhine.

Part of the pollution which is discharged into the Rhine dissolves in the water and is carried out to sea; another part attaches itself to the silt which sinks to the bottom of waterways and dock basins. Silt acts as a sort of filter, trapping the pollutants. This means that while the water may be cleaner, the silt can still be heavily polluted.

In 1984 one kilogram of harbour silt from the eastern docks contained on average 970 mg of zinc, 130 mg of copper, 180 mg of chrome, 230 mg of lead, 12.7 mg of cadmium and 2.8 mg of mercury. This was in addition to all sorts of organic micropollutants (such as PCBs and other chlorinated hydrocarbons).

10 million m^3 of polluted mud

Of the 23 million m^3 of mud dredged out every year by the City of Rotterdam and the government, 13 million m^3 is marine silt which can be dumped back into the sea. The remaining 10 million m^3 is river silt or a mixture of river and marine silt. Because of the pollutants it contains, this silt may not be dumped at sea and it is not advisable to dispose of it on land.

Since dredging nevertheless has to go on, a temporary storage site for polluted harbour silt, known as the "badkuip" (bathtub) has been constructed on the Maasvlakte, the most westerly section of the Rotterdam docks. This must accommodate the silt until 1987, when the "slufterdam" (creek dam) will be ready. The "slufterdam" (creek dam) is an artificial peninsula, which will provide a dumping site for polluted silt until the year 2002. The "badkuip" (bathtub) has cost 20 million guilders; the "slufterdam" (creek dam) will cost 225 million. Rotterdam cannot be expected to go on paying the bill for upstream discharges.

A clean Rhine in 2002

Rotterdam is not prepared to accept another "slufterdam" after the year 2002. Not only is such a storage site costly, it is by no means a welcome addition to the landscape. No new storage site means that, by that time, the quality of the harbour silt must be such that it can be safely dumped at sea or – better still – can be used on a large scale. Because there is a considerable time-lag between the cleaning up of the discharges and the improvement of the quality of the silt, work on it must start now. And this is happening on an international level – with the International Rhine Committee and the EEC. It is not without effect, but the rate of progress is far too slow to bring about the necessary clean-up in time. In view of the importance to Rotterdam of a cleaner Rhine, the city is no longer prepared to sit idly by and await whatever comes flowing down, but has gone into action. At the beginning of 1985 it set up the "Clean harbour silt" project, which will run until the end of 1989 – unless it achieves its aims before this. If the whole programme is completed as scheduled, it will cost the city around 10 million guilders.

Reaching clean-up agreements

At the heart of the project are the agreements which Rotterdam wants to make with the dischargers about cleaning up their effluent streams. These agreements will not be voluntary. The dischargers are, after all, responsible for the pollution of the river silt.

The City of Rotterdam's discussions with the dischargers will be backed up by the findings of an exhaustive, combined technical and legal investigation, which is being coordinated by the Port of Rotterdam Authority. The aim of the technical investigation is to identify the dischargers of the various pollutants, and to calculate each individual discharger's contribution to the pollution of the silt. Existing data is either unsuitable or hardly accessible.

Because it is impossible – both financially and practically – to identify the dischargers of all harmful substances simultaneously, the first phase has concentrated on the discharge of heavy metals, particularly cadmium, chrome, zinc, copper and lead. It is expected that tackling these pollutants will also have an effect on the discharge of other chemicals.

The legal investigation is concerned with the question of whether the City of Rotterdam can pass on to the polluters the additional costs of storing the silt as a result of the pollution.

Rotterdam has no choice

Every year, Rotterdam has to dispose of 10 million m^3 of polluted harbour silt. So far, the city has succeeded, but the cost – both financial and in terms of effort – has been high. Each time, an emergency solution has been found. An artificial peninsular as a silt dump is the final emergency solution. The problem must now be solved once and for all. A halt must be called to the chemical pollution of the Rhine. Rotterdam can no longer continue to foot the bill.

(Rotterdam Europoort Delta)

Bulk business grows at Southampton

Bulk handling at ABP's Port of Southampton expanded further with the first shipment of the port's newest bulk traffic, scrap metal exports.

The new facility, equipped by Associated British Ports, is operated by London-based scrap metal exporters George Cohen and Sons, and provides four ten-tonne cranes with new grabs at Berths 43 and 44. Deep-sea trade at the terminal is expected to reach 100,000 tonnes in the first year.

Southampton already handles liquid bulks, animal feed, specialised cable vessels and is well established as a major export outlet for home-produced grain.

Go-ahead for direct trader input at Grimsby and Immingham

ABP's South Humberside ports of Grimsby and Immingham have received the go-ahead from HM Customs for their new Direct Trader Input scheme.

Computerisation of Customs clearance at Grimsby and Immingham will start in June and will streamline the import entry procedure.

Shipping and forwarding operators around the port are investing in terminal equipment which will interface with the Customs computer network through the DTI System operated for Associated British Ports by Solent Container Services at Southampton. A similar scheme has been operating successfully at the ports of Southampton, Portsmouth, Poole and Hull since last October.

ABP will operate the system under the guidance of the Steering Committee which has strong local representation from all sections of the shipping and forwarding community as well as HM Customs and ABP.

Mr. Stephen Pearse, Assistant Port Manager at Grimsby and Immingham and Chairman of the Steering Committee, commented:

> "Our customers will benefit from the improved import clearances as well as having a system capable of being developed to accommodate future requirements of HM Customs and the shipping community".

New equipment boosts Hull's container terminal

The Port of Hull's Queen Elizabeth Dock Container Terminal is now one of the best equipped 'feeder' ports on the East Coast, following a £3 million pound investment in new equipment by the port's owners, Associated British Ports.

Five rubber-tyred gantries have been installed to handle containers on shore, and there is a fleet of eight tractor units with twenty four trailers for moving containers from quay to stacking area.

Further plans for the terminal include the provision of a third container crane, which will greatly improve ship to shore handling capability. The new crane is due to be in operation by the middle of this year.

Hull handled over 80,000 TEUs at its container terminal in 1985. The port's main container customers include United Transport Line, Geest North Sea Line, Maersk Line and Anglo European Container Line. Hull has recently seen continuing growth in the volume of feeder traffic for deep-sea destinations, in addition to containers in transit between the UK and its EEC partners.

$400,000 boat ramp opens; largest leisure development outside Adelaide

Stansbury's new $400,000 dual lane boat ramp is now in operation.

The ramp, breakwater and parking area is the largest leisure craft development outside metropolitan Adelaide. It will handle 100 boat launchings and retrievals a day.

The project required 1,000 cubic metres of dredging. The 90-metre breakwater took 5,000 tonnes of rock and the ramp 90 cubic metres of concrete. The one hectare carpark was reclaimed from the sea with 30,000 cubic metres of fill.

SA Marine Minister Mr. Abbott and Yorketown Council chairman Mr. George Sherriff opened the facility on Friday, February 14.

The project was funded jointly by the SA Government through the Department of Marine and Harbors, the Yorketown District Council and the Stansbury Progress Association which contributed $130,000.

At the opening, Mr. Abbott announced he had made funds available to seal the carpark with bitumen.

Mr. Abbott said the ramp was evidence of the Government's commitment to expanding recreational boating facilities in SA.

"The substantial investment made by the local community through the council and Progress Association also supports the view that adequate boating facilities are a necessity, Mr. Abbott said.

"I am confident that the ramp will provide a stimulus to tourism within this area in addition to providing a safe launching facility in the event of an emergency such as search and rescue." *(Shipping & Ports Journal)*

New malthouse opens new export horizons: Port of Geelong

The Port of Geelong is set to become one of the world's major malt export centres, following the opening late last year of Barrett Burston (Australia) Ltd's new $19 million malthouse in the heart of the Port's busy bulk shipping area.

The new facility was officially opened on November 14 by Australia's Minister for Trade, the Hon. John Dawkins, in the presence of Sir Ian McLennan, retiring Chairman of Elders IXL, Mr. John Elliot, Chief Executive and Chairman-elect, senior Barrett Burston staff and a host of visiting dignitaries.

With an initial production capacity of 72,000 tonnes (which can be doubled as demand requires) the new plant is the largest of its kind in Australia, and one of the most modern and efficient malthouses in the world.

Speaking at the opening ceremony, Sir Ian McLennan said the decision to build in Geelong reflected "the need for large capacity plants stocked from diverse barley growing regions to assure constancy of supply to overseas markets".

A large proportion of malt produced in Geelong is destined for the group's export markets in Japan, the Philippines, Indonesia, Fiji, Malaysia, Singapore, Brazil, Colombia, Peru and many other countries.

Whilst export consignments can be shipped bulk in containers, bags in containers, on pallets or random stowed, one of the features of the new plant is its direct conveyor link to the Bulk Grain Pier, which enables loading direct to ships' holds.

Barrett Burston expects to export more than 40,000 tonnes of bulk malt over the next twelve months.

(Portside)

New crane to be trendsetter: Port of Launceston

A $3 million mobile harbour crane – the latest in cargo crane technology – will be operating on Bell Bay's wharves by the middle of this year.

The crane is being specially designed and built in West Germany to the PLA's requirements, with some components built in Australia and as a purpose-built mobile cargo crane it will be able to use the No. 5 Common User Berth and the ANL Ferry Terminal.

It will also be used around the entire port area to assist with construction works and cargo handling.

The purchase of such a crane is in line with the Authority's long-held belief that flexibility of operation is the key to a successful port.

The Authority's General Manager and Chief Engineer, Mr. Griff Page, said the crane would be the first of its type in Australia and as such would be breaking new ground.

"The crane displays the confidence PLA Wardens have in the future of the port and I commend the board members on their decision. It continues the progressive attitude which has been shown in the past by the PLA," Mr. Page said.

"What is aimed for is a very flexible operation and that's possible with this crane which moves quickly and easily from one site to another.

"Its container handling rates are comparable to gantry crane operation and when it works in tandem with the existing No. 5 crane will provide a much quicker turn-around for container vessels.

"The crane also will give a back-up so that ship owners are not left stranded if a crane goes down.

"I can confidently say that because of its ability to be used for multiple purposes the crane will set a precedent for other ports," Mr. Page said. *(PLA News)*

New rail link opened: Port of Melbourne

The Victorian State Minister of Transport, Mr. Roper officially opened the new Webb Dock rail link and later journeyed to the complex aboard the first train along the line.

The Webb Dock rail line, the first major freight rail extension in Victoria for 20 years, will boost the Port of Melbourne's export potential.

In declaring the new facility open, the State Minister of Transport, the Honorable Mr. T. Roper, M.P., said the new $22 million line is an integral part of the future of Victoria's export industry and will provide a link between the Port of Melbourne and the intra- and inter-State rail network.

Mr. Roper said "The State Government's Economic Strategy is revitalising industry and improving the prosperity of Victoria.

"The 6.5 kilometre line is the first rail extension to the Port of Melbourne for 17 years and will greatly improve the movement of exports and imports. Improvements such as this new line will help to reduce export costs.

"The rail line will provide a direct broad gauge (5 feet 3 ins) connection to Victorian country towns and Adelaide, with direct transfer arrangements to the standard gauge (4 feet 8½ ins) rail network to NSW and Queensland."

The new broad gauge line has been constructed with the provision to install a standard gauge line along the same route.

"Now that the line is operating, Webb Dock can be developed to its full potential as a major shipping terminal, and will strengthen Melbourne's position as Australia's main container handling port", Mr. Roper said.

Webb Dock, the Port's five berth overseas and coastal roll-on roll-off lift-on lift-off complex, in 1984/85 handled 146,038 TEUs – 25% of containers passing through the Port.

Mr. Roper said the rail line would provide users of the terminal, particularly Australian National Line, with significant cost savings.

Port Chairmen's Conference reviews performance of major ports: Indian Ports Association

"During the Sixth Five Year Plan we have successfully increased our port capacity from 101 million tonnes in 1980–81 to 132 million tonnes at the end of the Sixth Five Year Plan. The traffic actually handled has also increased from 80 million tonnes in 1980–81 to 107 million tonnes in 1984–85. Though these are positive indications, yet we have to further optimize the use of available resources in order to further increase efficiency."

"I am also glad to note that the Indian Ports Association is playing an increasing role in building up self reliance in the ports and also in helping the Government in taking decisions by their consolidation of field expertise. I hope it will continue to play even a bigger role in the years to come and commend them for their laudable efforts.

With these words, I inaugurate this Conference and wish it all the success."

The above observation was made on 12.8.85 by Shri Z.R. Ansari, Minister of State for Shipping and Transport while inaugurating the Annual Conference of Port Chairmen. The Minister called upon the Chairmen to individually monitor the performance of their Ports ensure that objectives are fully achieved in all fields. The shortfalls must be identified and plugged expeditiously.

The Minister said that he would like to see that our Ports in India also achieve such standards of modernisation and efficiency as are available in developed countries. He asked the Chairmen to come up with new ideas and fresh thinking on how to modernise the Ports and keep abreast of the technological changes to as to keep up with the present demands of traffic.

Shri Ansari said that he was happy to note that during the course of the year the three main aspects relating to the port procedures, i.e. a uniform documentation system, simplification of payment procedures and need for rationalisation of tariff structures have been looked into by the Directing Group and the Empowered Group has also examined these recommendations and given its final opinion. Government orders in this connection would be issued shortly. He asked the Chairmen of all the Ports to ensure that the suggestions are implemented vigorously.

The Minister said that the Ports must ensure that handling of such essential commodities as sugar, edible oils, POL do not suffer any neglect. The Port Chairman should also ensure that all the development schemes financed either through the regular Plans or through non-Plan provisions, must be implemented within the stipulated time period and the financial provisions sanctioned.

Shri Ansari said that it was very necessary to plan movement of ships at the Ports. Referring to idle time of ships at berths the Minister said that the need for a proper monitoring-cum-inter-port communication system is of paramount importance now. We must go in for computer-based data systems at each port level. He said that with proper planning, even the financial performance of the Ports can improve. There was also an abundant scope for improving the levels of output performance in respect of handling of break bulk cargo.

Shri Ansari said that the Ports must become self-financing institutions in their own right. In this connection he suggested that the ports should review the port charges from time to time.

The Minister stated that the Prime Minister has emphasised on the need for decentralisation of decision making processes and enforcement of accountability. We must review quickly our administrative process to achieve these ends. Needless movement of papers must be eliminated and everybody should become accountable for his/her decisions.

Shri Ansari said that the Major Ports Reform Committee was expected to give its report soon. The recommendations of the Committee are keenly awaited.

In his welcome address the Shipping and Transport Secretary, Shri P.P. Nayyar, called upon the Port Chairmen to take immediate steps to introduce single window service and cut down detention time of ships which is estimated to cost the shipping industry around Rs. 40 crore annually. He said that the Major Ports have set an all-time high target of handling 126 million tonnes of cargo during the current year. The Ports sector is a service organisation and we should provide economic, efficient and courteous service.

(Indian Ports)

Port of Nagoya invites passenger ships

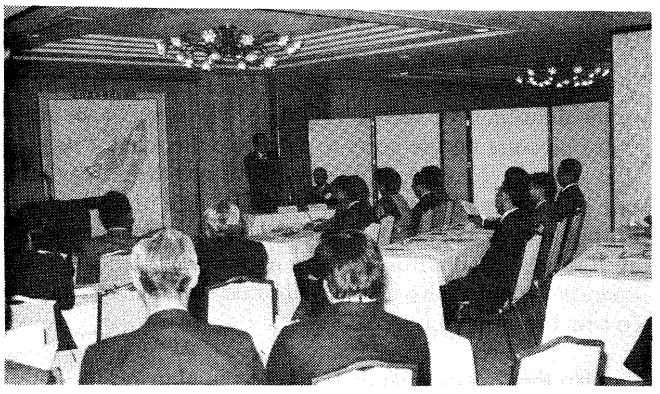
Nagoya Port Authority held an explanation meeting and reception at Palace Hotel, Tokyo, on March 5, under the joint sponsorship of Nagoya Chamber of Commerce and Industry. The aim of this presentation is to attract as many foreign luxury passenger ships as possible to the Port of Nagoya.

This is the second occasion and was a greater success than the first one in August 1984. This time, the attendants counted 35 people from 18 organizations: the agents for the shipping companies of passenger ships such as the 'Queen Elizabeth 2," the "Canberra" or the "Royal Viking Star," a foreign government tourist bureau, tourist agencies. There also were the Far East Representatives of the Ports of Los Angeles and Baltimore (these two ports are sister ports of Nagoya) and Mr. Kondoh and Ms. Takeda from I.A.P.H.

The meeting began with the introductory film "Port of Nagoya Today" which was followed by the welcome speech delivered by Mr. Yoshiro Haraguchi, Executive Vice President of N.P.A. In his speech, Mr. Haraguchi explained how N.P.A. exerts their best to invite foreign passenger ships and what they have been doing to make the port an attractive place for the citizens as well as for the foreign visitors. The Garden Pier has a berth prior to the passenger ships. It also has a park, the Nagoya Port Building and the Retired Antarctic Observation Ship "Fuji" (Antarctic Museum.) Adding to these facilities for the visitors, he also mentioned the gangway to be completed by next January. This should be of a great convenience to the passengers. Mr. Haraguchi concluded his speech by mentioning some of the places of interest nearby.

The high interest of the attendants was proved by the many questions and demands given to the sponsors at the reception after the meeting. The representative of John Swire & Sons (Japan) Ltd., the agent of the "Queen Elizabeth 2," the "Canberra" and the "Rotterdam," said, "This meeting is very impressive and helpful to understand how the Port of Nagoya changed its former image as an industrial port to an attractive port for everybody. It will be very effective if they extend their positive propagation overseas by visiting the foreign shipping companies directly, for example."

Since the entry of the West German ship "Europa" (33,819 G/T) in April 1983 and the Norwegian ship "Royal Viking Star" (28,000 G/T) in November 1984, one or two over 10,000 G/T passenger ships have entered the port every year. Since 1987 is to be a memorable year for the port, the 80th anniversary, not only the port related people but the general citizens of Nagoya earnestly hope to invite as many luxury passenger ships as possible by taking this opportunity.



Exec. Vice President of N.P.A., Yoshiro Haraguchi speaks to the guests at the presentation.

11th Annual Meeting of ASEAN Ports: Port of Singapore

The 11th Meeting of the ASEAN Port Authorities Association (APAA) was held at the Rasa Sayang Hotel in Penang from 9 Jan. – 10 Jan. 1986. Representatives from 17 ports from Indonesia, Malaysia, Philippines, Thailand, Brunei and Singapore attended the event.

In his speech, PSA's General Manager, Mr. Wong Hung Khim, in his capacity as Chairman of APAA, reviewed the main events during his two-year chairmanship and proposed how ASEAN ports can best tackle the problems brought about by the current world economic situation.

Here are some excerpts of his speech: "1984 will be remembered for three events, namely, the entry of Brunei Darussalam into our fold, the Seminar on Human Resource Development through Quality Circles which was held in Singapore and the 10th anniversary celebrations of APAA in Bangkok. 1985 will best be remembered for the superb and grand way in which Indonesia hosted the 6th APAA

Working Committee Meeting in Medan and the 10th Interport Sports Meet in Surabaya. We are happy that through a spirit of consensus and compromise APAA has been uniquely constituted so that it is able to abundantly satisfy the needs of its members for a better understanding of each other and the promotion of closer relationships. This has led to a lot of bilateral consultation and help going on between ASEAN ports."

"During the past decade, APAA has made significant progress in organising itself and gaining worldwide recognition. However, its operating scenario has shifted dramatically during this period. On the one hand, ASEAN Ports have been shedding their bureaucratic machinery and becoming more autonomous and commercial in outlook. This has helped the development of modern facilities and the provision of efficient services. On the other hand, the world economic climate has unfortunately moved from good times to bad. The current situation for us is also far from promising no matter how we look at it. The energy producers have been facing over-production, underconsumption and low prices. The producers of mineral resources are worse off and the agricultural sector is in a similar plight. Under these conditions, countries without natural resources and dependent solely on the service sector have also been hard hit.

"While the ports are not as badly off as most other sectors of the economies, shipping has remained very much in the doldrums for such a long time. The consequent build-up of pressure on the ports to help bale them out is so great that it has become imperative for us to switch strategy from one of growth to one of consolidation. The proven remedy in these circumstances is to identify and eliminate wastage and lavish expenditure, upgrade current standards and operations and shelve new developments which are unlikely to ease the situation.

"In this stormy global economic climate, ASEAN's once strong, steady and healthy growth figures which were the envy of many developing countries, have also suffered. 1985 has seen a drastic decline in the growth rates of the countries in ASEAN with some having to contend with negative growth rates for the first time. Likewise, 1986 is going to be another tough year with little or no growth. The port sector is expected to follow this somewhat pessimistic overall picture while the shipping sector is unlikely to recover from its present gloom before 1988.

"In these difficult circumstances, it would be timely for APAA to consider a change of course to meet the challenges ahead. Our deep friendship must be put to better use for mutual gain. Some of the thorny and contentious issues that are impeding our growth must be removed. We have to break fresh ground and help each other dismantle the barriers that are holding us back from servicing our region more efficiently and economically. We have many plus factors to help us along. For example, we have become a closely-knit group. We are at ease with each other. We have learnt to appreciate each other's culture, customs and traditions. We find each other's music, attire and culinary fare delightful. We note that in many facets of our lives, we are frequently interlinked. With the excellent camaraderie that has been fostered, the general mood amongst us is that we all want to help each other to do better. The problem is how do we do it without hurting ourselves in the process. The rational answer is to find less competitive but more complementary roles for each other. We have to work towards increasing the overall size of our economic cake so that everyone can have a larger slice. Finding the means to achieve this goal should be our challenge for the next decade of APAA."

The 11th Meeting of APAA also marked the handing over of the mantle of Chairmanship of ASEAN Ports from the Port of Singapore Authority to the Port Authority of Thailand. *(PSA News)*

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