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PORTS and HARBORS

November, 1982 Vol. 27, No. 11

Port of Singapore

The Publisher: The International Association of Ports and Harbors

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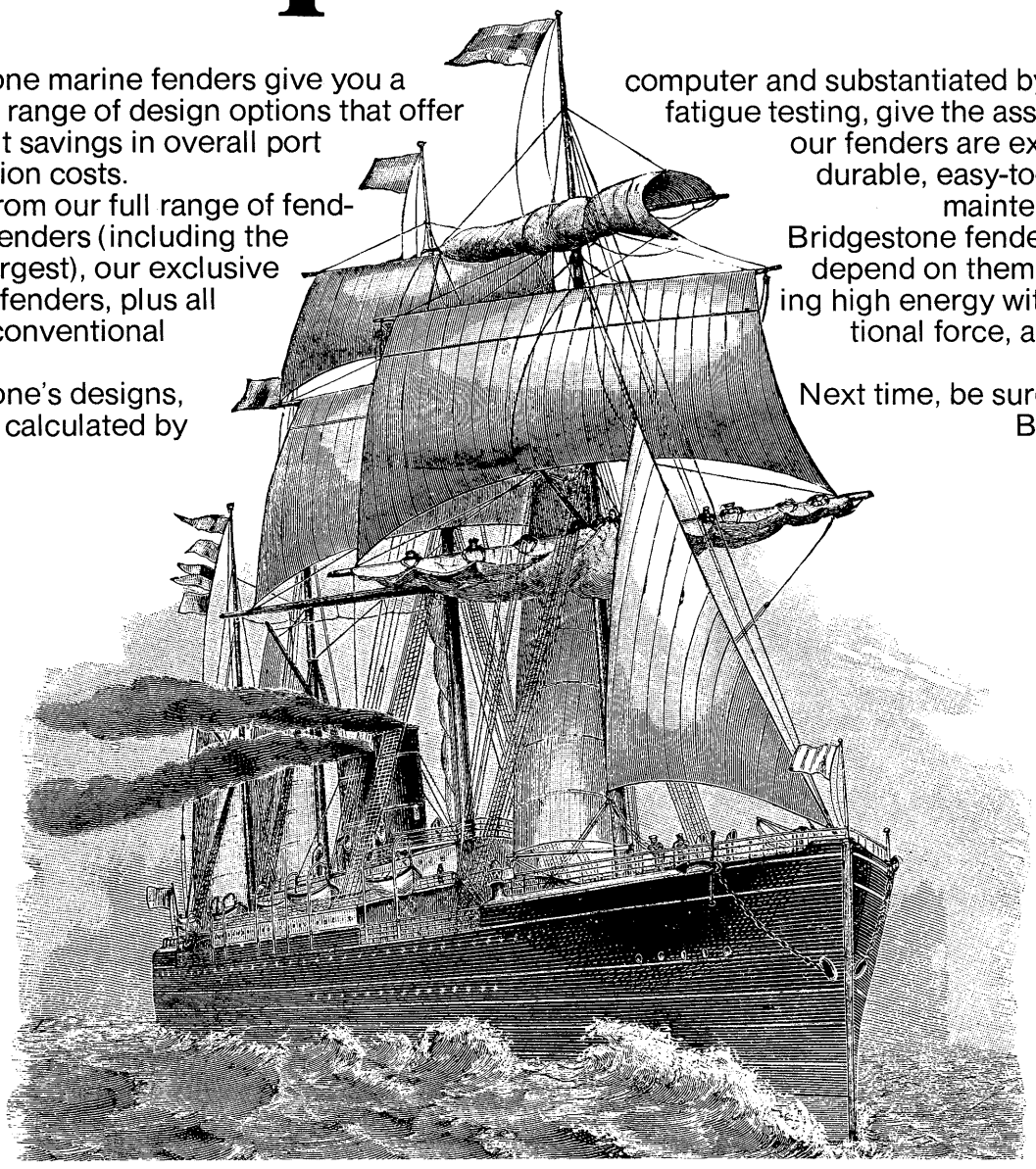

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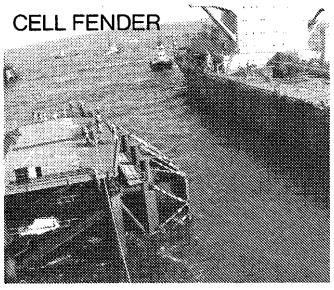

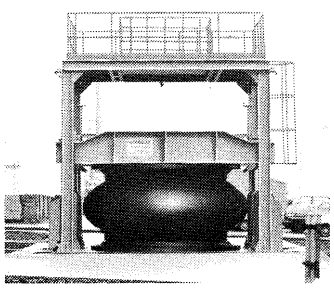

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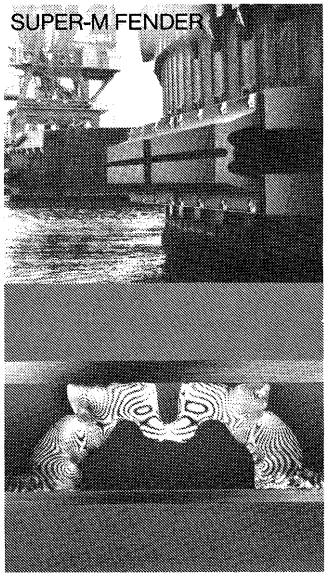

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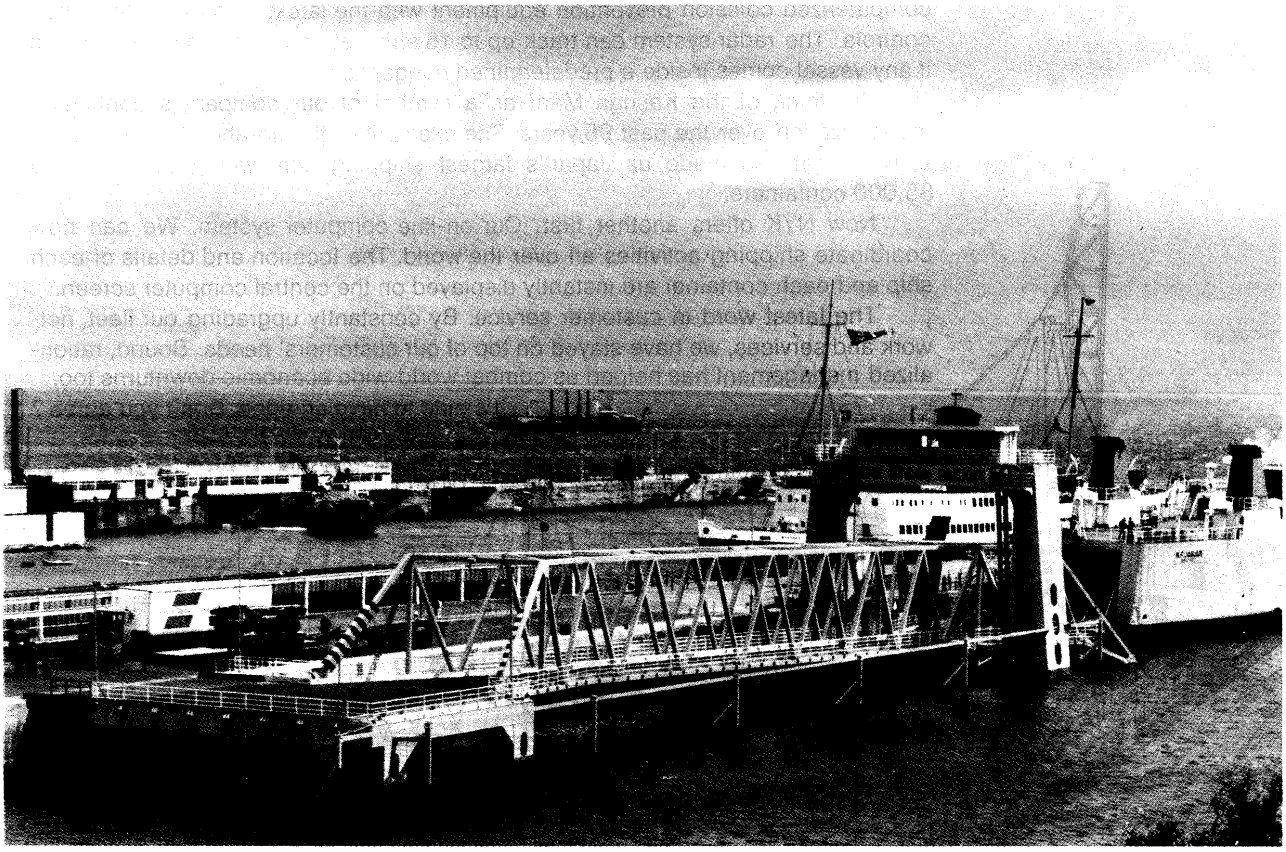
NEW LINKSPAN FOR ISLE OF MAN



Navire Cargo Gear have delivered a linkspan for the Isle of Man Steam Packet Company, providing a new ro-ro freight service between Douglas Harbour and Liverpool.
The facility, operative at all states of the tide, consists of a 70 m long roadway supported on twin pontoons. In normal service these pontoons are ballasted, allowing the structure to rest firmly on the seabed. If the linkspan should need to be moved to a new location, the pontoons are easily de-ballasted.

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We think of the Kasuga Maru as a symbol of our company's continuing modernization over the past 96 years. She exemplifies the go-ahead thinking here at NYK that has made us Japan's largest shipping firm, with 340 ships and 85,000 containers.

Now NYK offers another first. Our on-line computer system. We can now coordinate shipping activities all over the world. The location and details of each ship and each container are instantly displayed on the central computer screen.

The latest word in customer service. By constantly upgrading our fleet, network and services, we have stayed on top of our customers' needs. Sound, rationalized management has helped us combat world-wide economic downturns too.

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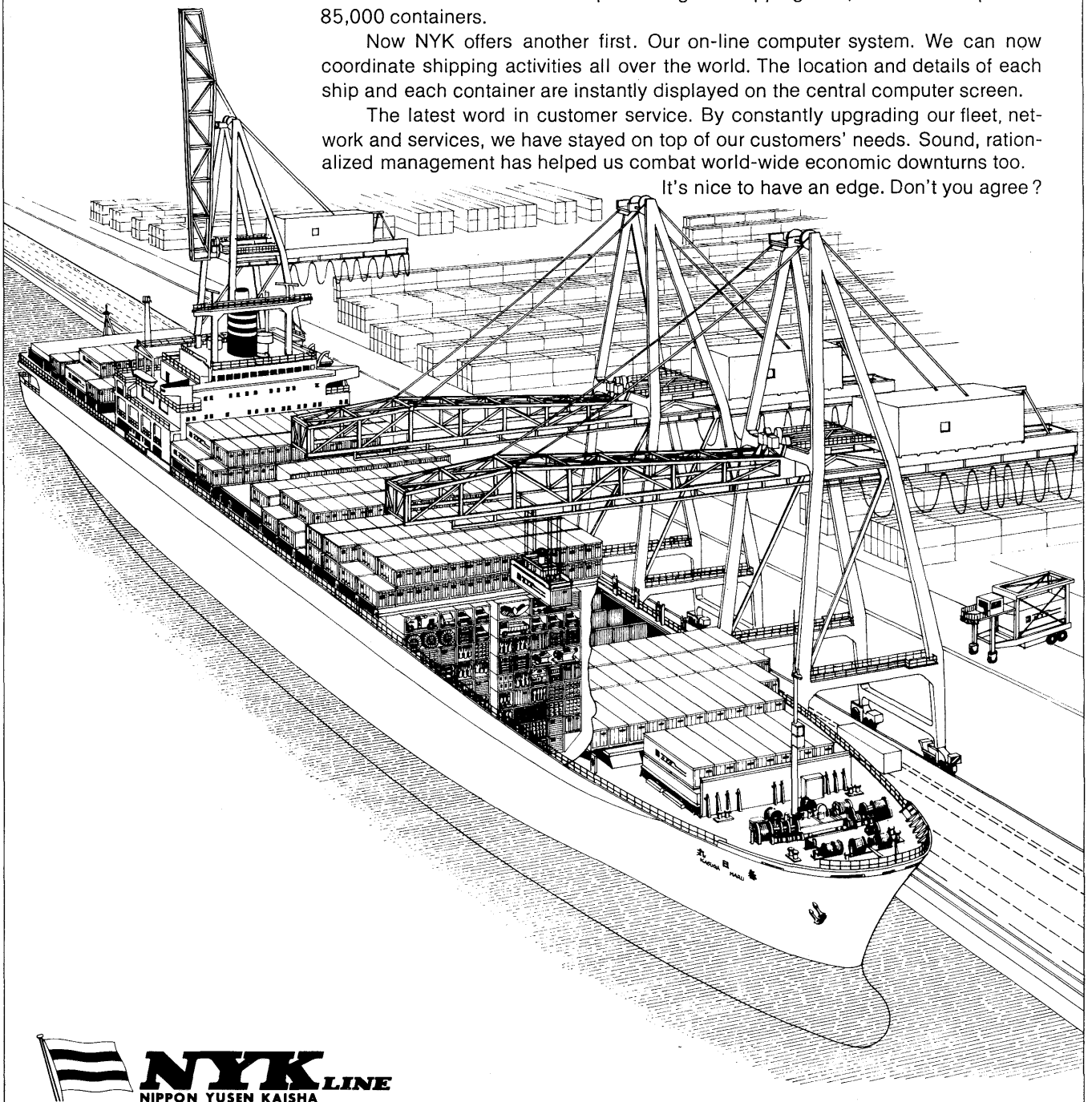

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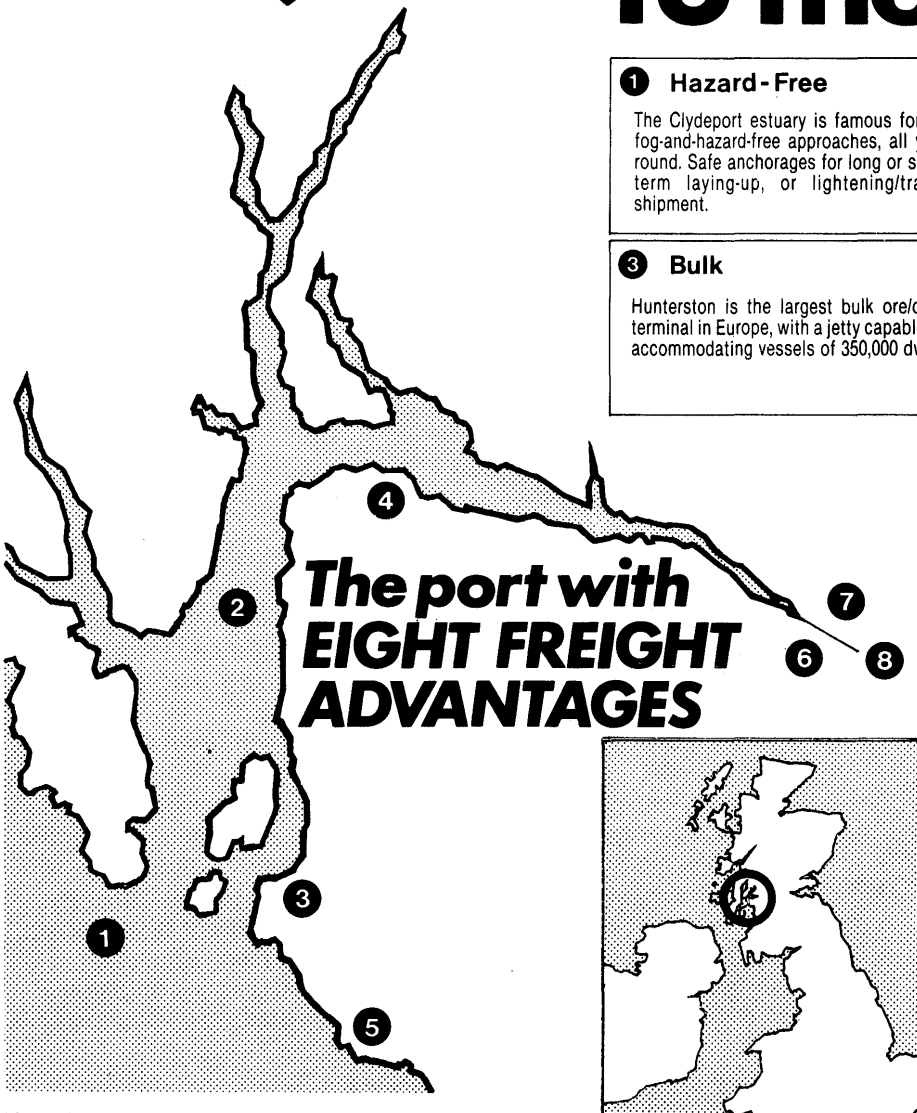

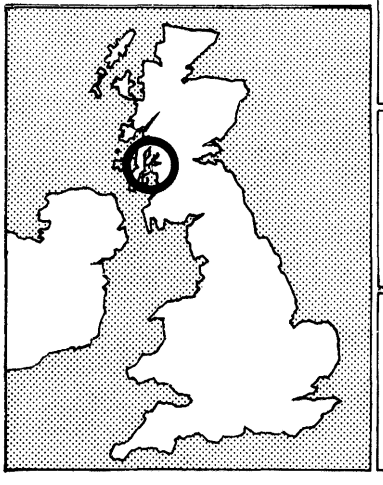

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Clydeport's sheltered deep water can accept the largest ships afloat or envisaged. VLCC's navigate with ease with over 100 feet of water to the BP terminal at Finnart.

❸ Bulk

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❹ Containers

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❺ Coastal

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❻ Break-Bulk

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❼ Grain

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PORTS and HARBORS

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The International Association of Ports and Harbors

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Cable: "IAPHCENTRAL TOKYO"
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November, 1982 Vol. 27, No. 11

CONTENTS

The Cover: **Port of Singapore (Tanjong Pagar Container Terminal)**

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Port Qaboos, Muscat

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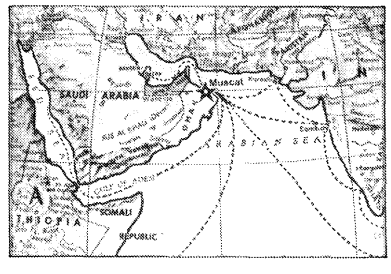

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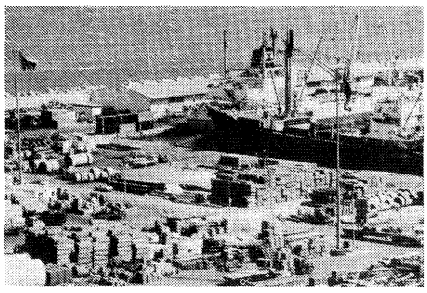
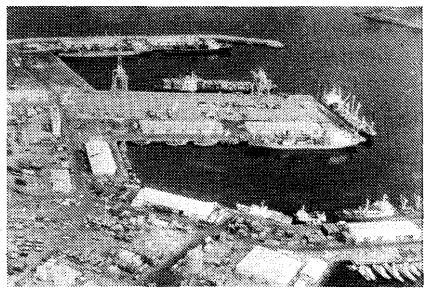




IAPH announcements and news

A Tentative Program for the Vancouver Conference announced

The formation of the program has been exerted by the Conference Organizing Committee (Chairman: Mr. J.A.C. Barratt) established within the Port of Vancouver, the Host, during the past months. Incorporating those basic and given points by the Exco, and taking close coordination contacts with the head office, the Committee introduces a tentative program for the Vancouver Conference. This tentative program will duly be finalized by the further inclusion of more details and eventually by obtaining the Board approval.

Special features to be staged at the 13th Conference will be:–

Working Sessions on "Hazardous Commodities" (No. 1 Session), "Automated Data Processing Techniques Affecting Carriers, Cargoes and Ports" (No. 2 Session), and a Joint Session with IAASP (Int'l Asso. of Airport and Seaport Police), all of which are intended to provide the delegates with the chance of discussing those important items and getting acquainted with the new ideas as well as techniques now being developed. A presentation on the reputed Roberts Bank Super Port will be another speciality, as the presentation covers those essential factors for the development. It will be a live case study report.

It is believed that those special features will give delegates substantial advantages and incentives. Benefits from their participation in the Conference and working sessions will be eagerly anticipated for.

Reserve your time now for the Vancouver Conference.

Tentative Program (Daily schedule):

(As of Sept. 25, 1982)

FRIDAY, JUNE 3, 1983

14:00–17:00 . . . . Courtesy calls by IAPH Officers

SATURDAY, JUNE 4, 1983

08:00–17:00 . . . . Registration
09:00–12:00 . . . . Committee meetings
12:00–14:00 . . . . Free time
14:00–16:00 . . . . Committee meetings
16:00–17:00 . . . . Committee meetings
18:00–18:30 . . . . Opening of Exhibition
18:30–20:00 . . . . Exhibition & Exhibitors
– Cocktail reception

SUNDAY, JUNE 5, 1983

08:00–17:00 . . . . Registration
09:00–16:00 . . . . Exhibition
09:00–11:00 . . . . Committee meetings
11:00–12:00 . . . . Committee meetings
12:00–14:00 . . . . Free Time
14:00–16:30 . . . . Pre-Conference Meeting of Board of Directors & Executive Committee
14:00–16:30 . . . . Misc. sightseeing tours
18:00–20:00 . . . . Secretary General Cocktail Reception

MONDAY, JUNE 6, 1983

08:00–17:00 . . . . Registration
09:00–16:00 . . . . Exhibition
*09:00–11:00 . . . . Official Opening Ceremony
11:00–12:00 . . . . Conference Keynote Speech
Speaker: – to be advised
12:00–14:00 . . . . Cocktails and Luncheon
Speaker: – to be advised
*14:30–16:30 . . . . First Plenary Session
17:00–18:00 . . . . Meeting of Chairman & Group leaders for Working Session
19:00–20:00 . . . . Opening Reception
20:00–24:00 . . . . Dinner/Dance
– hosted by Port of Vancouver

TUESDAY, JUNE 7, 1983

09:00–16:00 . . . . Exhibition
09:00–12:00 . . . . Working Session #1
Subject: "The Safe Handling and Transportation of Hazardous Materials"
09:00-09:30. . Introductory Speech
– Speaker to be chosen from Dangerous Goods Symposium held September 1982, Vancouver, B.C.
09:30-09:45. . Break
09:45-10:45. . Group Discussion
10:45-11:00. . Reassemble
11:00-12:00. . Report of Group Leaders (to be announced)
12:00–14:00 . . . . Luncheon
Speaker: – to be advised
14:15–17:00 . . . . Roberts Bank Presentation:
14:15-14:30. . Historical Review
Speakers: Mr. Leighton
– Swan Wooster Engineering Co. Ltd.
14:30-14:50. . Audio-Visual Presentation
14:50-16:00. . Paper Synopsis
– a 10 to 15-minute paper synopsis by one speaker in each of the three areas outlined below:

a) Engineering
Speaker: Mr. B.A. Ekstrom
– Assistant General Manager
Port of Vancouver
b) Environmental
Speaker: Mr. J. Secter
– Province of British Columbia
Ministry of Environment
c) Community Relations
Speaker: Mr. J.A.C. Barratt
– Mgr Corporate Communication
Port of Vancouver

16:00–16:15 . . . . Break
16:15–17:00 . . . . Roberts Bank Panel Discussion:
Moderator: Mr. Leighton
– Swan Wooster Engineering Co. Ltd.
18:30–19:30 . . . . Cocktail Reception
Evening Free

WEDNESDAY, JUNE 8, 1983

09:00–16:00 . . . . Exhibition
09:00–12:00 . . . . Port Tour #1
or
09:00–12:00 . . . . City Tour
12:15–14:00 . . . . Lunch
14:00–17:00 . . . . Port Tour #2
or
14:00–17:00 . . . . Roberts Bank Tour
19:00–23:00 . . . . Evening entertainment & dinner
– hosted by Port of Vancouver

THURSDAY, JUNE 9, 1983

09:00–16:00 . . . . Exhibition
09:00–12:00 . . . . Joint Work Session with International Association of Airport & Seaport Police (IAASP)
– details being finalized
11:45–14:00 . . . . Luncheon
Speaker: – to be advised
14:00–14:30 . . . . Break
14:30–17:30 . . . . Working Session #2
Subject: "Automated Data Processing and Communication Between Ports & their Users".
14:30-15:15. . Introductory Speech
Speaker: Mr. R.L.M. Vleugels
– Director General
Port of Antwerp
15:15-17:30. . Discourse by representatives of:
a) Major European Ports
b) Lloyds of London
c) The Erno Consortium
d) The Commission of European Communities
Followed by: – Demonstration
– Discussion
– Wind-up
18:30–19:30 . . . . Cocktail Reception
Evening Free

FRIDAY, JUNE 10, 1983

08:30–10:45 . . . . Port Management Paper Presentation & Commentary
– Each speaker and commentator gives 10 minute synopsis of paper.
Moderator: Mr. H. Mann
– Vice President
Swan Wooster Engineering Co. Ltd.
08:30-09:00. . Paper Presentations:
1) Finance & Human Resources
Speaker: Mr. F.J.N. Spoke
– General Manager
Port of Vancouver
2) Planning & Development
Speaker: – to be advised
3) Lease & Operating
Speaker: – to be advised
09:00-09:30. . Commentators:
1) Finance & Human Resources
Speaker: – to be advised
2) Planning & Development
Speaker: – to be advised
3) Lease & Operating
Speaker: – to be advised
10:45–11:00 . . . . Break
11:00–12:15 . . . . Synthesis on Conference Working Sessions:
– presentation of synthesis by Chairmen of working sessions
– open discussion
– general synthesis by President
12:30–14:00 . . . . Luncheon
Speaker: – to be advised
14:00–14:30 . . . . Break
**14:30–16:30 . . . . Second Plenary Session and Closing Ceremony
17:00–18:00 . . . . Press Conference
18:30–24:00 . . . . Farewell Dinner/Dance
– hosted by Port of Vancouver

SATURDAY, JUNE 11, 1983

09:00–11:00 . . . . Post Conference joint meeting of the Board of Directors and Executive Committee.
Followed by a meeting of the Executive Committee for site selection of their 1984 executive meeting.
12:00–onwards . . Departure for Post Conference Tours.

***is being coordinated with IAPH Secretariat.*

* * * * *

PORT OF VANCOUVER

1900 - 200 Granville Street
Vancouver, B.C. Canada V6C 2P9
Telephone: (604) 666-3226
Telex: 04-53310

We are looking forward to sharing our warm hospitality and breathtaking beauty with you in June, 1983.
Make your plans now to join us.

IAPH celebrates its 27th birthday

November 7, being the date that IAPH was officially established 27 years ago, in Los Angeles, "Ports and Harbors" would like to draw its readers attention to the tremendous progress made since that historic date.

At the first conference the IAPH Constitution and By-Laws were adopted and its first Officers elected: President, 1st and 2nd Vice-Presidents and the Chief of the Central Secretariat. The Board of Directors was established from members of the original 14 countries namely: Canada, Rep. of China, West Germany, Japan, South Korea, Liberia, Mexico, Peru, Sweden, Thailand, USA, Venezuela and South Vietnam (Vietnamese membership discontinued after the conclusion of the Vietnam war).

As is IAPH policy, a new president is elected after every conference. To date the list of IAPH presidents is as follows:

Bennett Roberts – Canada
John-Iwar Dahlin – Sweden
Lloyd A. Menveg – U.S.A.
Dr. Jen-Ling Huan – Republic of China (Taiwan)
John P. Davis – U.S.A.
Viscount Simon – U.K.
Dr. Chujiro Haraguchi – Japan
Victor Swanson – Australia
A. Lyle King – U.S.A.
Robert L.M. Vleugels – Belgium
Howe Yoon Chong – Singapore
George W. Altvater – U.S.A.
Paul Bastard – France
Arthur S. Mayne – Australia (current president)

Hollywood, California, was the site chosen for the conference that established IAPH. Subsequent conference sites were as follows:

- Los Angeles – 1955
- Mexico City – 1959
- New Orleans – 1962
- London – 1965
- Tokyo – 1967
- Melbourne – 1969
- Montreal – 1971
- Amsterdam/Rotterdam – 1973
- Singapore – 1975
- Houston – 1977
- Deauville (Le Havre) – 1979
- Nagoya – 1981

The Association has been served by three Secretaries General, namely Gaku Matsumoto who retired in 1967, Toru Akiyama, Secretary General Emeritus who retired in 1973 (and is now the President of the IAPH Foundation) and the present Secretary General Dr. Hajime Sato.

Under the Board of Directors, which is composed of members from 74 member countries, IAPH has an Executive Committee of 22 members, 3 internal committees and 6 technical committees, which are all served enthusiastically by those concerned. In addition to the 9 committees mentiond, the Association also has a committee of legal counselors who assist the Secretary General and his staff, in their handling of legal matters both at IAPH conferences as well as during the inter-conference period.

IAPH has always strived to maintain close contact with other international maritime organizations, providing for mutual access to expertise and resources in respective sectors. At present, the Association has 4 liaison officers with IMO, UNECOSOC, UNCTAD and CCC. In order to further those ties, IAPH concluded an agreement with the British Ports Association in which the BPA would act as representative to other non-governmental international maritime transport organizations, based in Europe. As a result, liaison work has increased substantially, and the IAPH status has become more important internationally.

For the first time in the history of IAPH, its journal "Ports and Harbors" has been made available in Japanese and Spanish (selected sections only), thanks to the tremendous support provided by the IAPH Foundation.

We are also pleased to announce that the Association's head office has been refurbished and some new equipment, including an English Word Processor, has been added.

On this special day for IAPH, it is a good time for us to look back over the years and see how far we, as an international body, have come in developing understanding and cooperation amongst the world's ports. We look to the future and seek even greater benefits from our joint endeavors.

20 entries received for the Award Scheme 1982

By the closing date, set at September 1st, 1982 for the third treatise contest known as the IAPH Award Scheme, a total of 20 entries had been received at the Tokyo Head Office. The entries consist of 5 from Bangladesh, 4 from Nigeria, 2 from El Salvador, one each from Congo, Ghana, Malaysia, Mexico, Panama, Singapore, USSR, Yugoslavia and Zaire.

These entries have been sent to Mr. J.K. Stuart, Chairman of the Committee on International Port Development for judgement by a panel of experts which will be appointed later by the Executive Committee and a decision of the prizes will be made no later than 1st January, 1983. The first prize for the winning entry will be a silver medal from the IAPH, US$750 and an invitation, including travelling costs and hotel accommodation, to attend the 13th Conference of IAPH, in Vancouver where the recipient will be commended during the 1st Plenary Session scheduled on Monday, June 6, 1983.

In addition to the first prize, second, third, and fourth prizes of US$500, US$400, US$300 will be awarded to the next best entries. Also an additional prize of US$100 each will be awarded to any other entries judged by the panel to be of a sufficiently high standard.

The winning entry will be published in "Ports and Harbors" following the announcement of the result by the panel of experts.

Community Attitude Survey Fund: Contribution Report

With thanks, this is to report that the following contributions were made to the Fund, as of October 18, in addition to the list reported in the October issue:–

Port Authority of NY & NJ (USA)	US$500
North Fraser Harbour Commission (Canada)	US$350
Port of Quebec (Canada)	US$350
Port of Houston (USA)	US$350
Port of New Orleans (USA)	US$350
South Carolina State Ports Authority (USA)	US$350
Port of Seattle (USA)	US$350
Dublin Port & Docks Board (Ireland)	US$700
Port of Long Beach (USA)	US$350

Dredging Task Force Fund (1983): Contribution Report

With thanks, this is to report that the following members contributions were received, as of Oct. 18, in response to the Secretary General's solicitation letter of August, 1982, to the Fund.

Port of Brisbane Authority (Australia)	US$500
Port of Melbourne Authority (Australia)*	US$750
Nagoya Port Authority (Japan)	Yen 150,000
Kelang Port Authority (Malaysia)*	US$250
Port of London Authority (U.K.)*	US$500
Port of Stockholm (Sweden)	US$300
Belawan's Port Administration (Indonesia)	US$150
International Association of Dredging Companies (Netherlands)	US$2500
Port of Aalborg Authority (Denmark)*	US$200
Port of Copenhagen Authority (Denmark)*	US$100
Port of Saint John, N.B. (Canada)	US$100
Port of Gothenburg (Sweden)*	US$500
Fraser River Harbour Commission (Canada)*	US$200
Townsville Harbour Board (Australia)*	US$200
Marlborough Harbour Board (New Zealand)*	US$100

(*: Second contribution)

Committee member appointments

The following committee member appointments have been made by President Mayne for the term until the 13th Conference of IAPH in Vancouver, June, 1983.

Mr. Erik Hesselbjerg, the newly appointed chairman of the Port of Copenhagen, succeeding Mr. J.H. Zeuthen, who recently retired, as a member of both the Constitution and By-Laws and Public Affairs Committees.

Professor G.G.S. Munoru, the newly appointed chairman of the Kenya Ports Authority, succeeding Mr. L.W. Wambaa who recently retired, as a member of the Finance Committee. (According to information from the Kenya Ports Authority, Mr. Wambaa has now been appointed as chairman of the Kenya Railways.)

Mr. John Mather, Managing Director of the Clyde Port Authority, U.K., has succeeded Capt. A.T. Yong, who recently retired, as a member of the Sub-committee on Marine Safety of the Committee on Port Safety, Environment and Construction.

Visitors

– On August 31, Mr. John M. Pisani, Director, Office of Port and Intermodal Development, Maritime Administration, U.S. Dept. of Transport, visited the head office and was received by Mr. Kusaka, Dy. Secretary-General. In September, Mr. Pisani visited Port of Yokohama and was received by Mr. T. Shiba, Director of Planning, Bureau of Port & Harbour, Yokohama City. Mr. Pisani was in Tokyo after visiting major ports of China for three preceding weeks.

– Port of Oakland Trade Mission, headed by Mr. Herbert Eng, President of the Board of Harbour Commissioners, on its way to Korea, Taiwan, ROC, Hong Kong, Singapore, Malaysia, Philippines and Indonesia, organized a reception on the evening of Sep. 21, at Kaiun Club Building. Dr. Hajime Sato and senior staff of the head office were invited to the reception and met the Oakland delegation including Mr. Walter A. Abernathy, Executive Director.

Membership Notes

New Members

Regular Member

Port of Devonport Authority

P.O. Box 478, Devonport, Tasmania 7310
Office Phone: 004-24 1951
Telex: 59222
Cable: PORDEV
(Mr. Dallas J. Cowan, General Manager)

Associate Member

TECHNOEXPO (Class D)
8, rue de la Michodière, 75002 Paris–France
Office Phone: 742 92 56
Telex: 211 897 TECEXPO
(Mr. François M. Algoud, President)

The emblem of the Nagoya Port Authority

The emblem of the Nagoya Port Authority was created in 1953, three years after the port's establishment in 1951.

The design expresses the spirit of co-operation between the two controlling local government bodies, namely, Aichi Prefecture and Nagoya City.

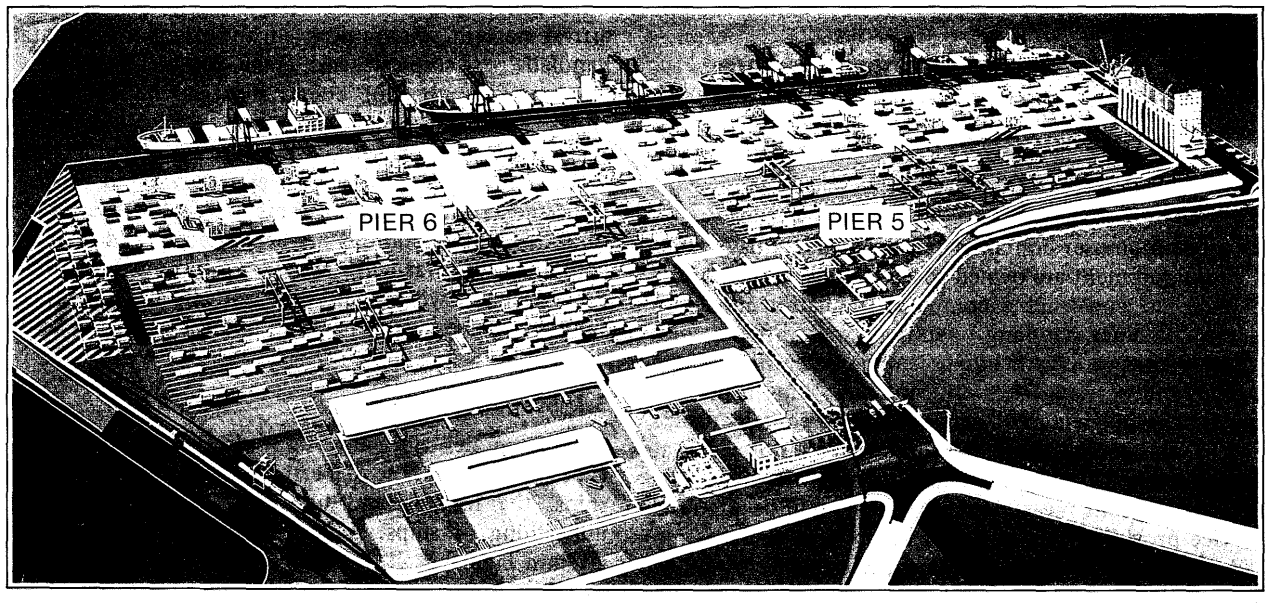
An anchor symbolizing the Port of Nagoya is added to the design to signify the close relationship and cooperation of the three administrations towards development of the greater Port of Nagoya.

BUSAN CONTAINER TERMINAL

DOUBLES its capacity and

container fleets are INVITED to call & enjoy

BETTER SERVICES



1982 may be a year worth to look back for the container fleets serving Far-Eastern routes. Additional container terminal(Pier 6) is now nearing completion extending to the Busan Container Terminal(Pier 5).

Pier 5 container terminal(opened:1978) already handled 364,000 TEU in 1981 and this traffic volume will be increased up to and exceed 400,000 TEU in 1982.

Further, as a part of 2nd phase development project of the Port of Busan and in order to meet ever increasing terminal user's requirement, extended container terminal (Pier6) shall be realized on 335,000m² reclaimed land with 4 gantry cranes and 9 rubber tyred transtainers and other up-to-date equipments. Especially CFS is to be extended quadruple times larger than present one thus securing sufficient spaces to render better services to various teminal users.

CLASSIFICATION	EXISTING TERMINAL (PIER 5)	PROJECTED TERMINAL (PIER 6)	TOTAL CAPACITY
TOTAL LAND	326,550m²	335,000m²	661,550m²
BERTH LENGTH	659m	603m	1,262m
BERTHING CAPABILITY	(2)× 50,000DWT	(2)× 50,000DWT	(4)× 50,000DWT
GANTRY CRANE	4	4 (2:40.6TON)	8
STRADDLE CARRIER	6	6	12
TRANSTAINER	4	6 (1:RAIL)	10
C F S	5,119m²	20,033m²	25,152m²
ANNUAL HANDLING CAPACITY	300,000TEU	420,000TEU	720,000TEU

BCTOC

Busan Container Terminal Operation Company

#1116 Jwachun Dong Dong-Ku
Busan, KOREA
TLX: K3785 BCTOC

Open forum:

Computer Simulation Model to find the Optimum Level of Equipment Investment in a Container Terminal

By: Messrs Leong Kum Hoong, Dy Director (Engineering Services)
Eric Lui, Asst Director (Data Processing)
Yap Cheng Hua, Systems Manager
Keh Eng Song, Administrative Assistant
Port of Singapore Authority

1. Synopsis

In a common-user container terminal where quay cranes and yard equipment are owned and operated by the port, it is possible to construct a computer simulation model to simulate container handling operations with different mix of quay cranes and yard equipment in order to find the queueing and service times of container ships using the terminal. The queueing and service times of container ships represent the service level that the terminal provides at different levels of equipment investment. The higher the level of equipment investment, the higher will be the level of service provided, but so would be the cost to the terminal. An optimum level of equipment investment would be one where the overall cost to the terminal and to the ship operators is at a minimum for a particular level of container traffic. This article describes such a simulation model developed by the Port of Singapore Authority to forecast its equipment requirements at the Tanjong Pagar Container Terminal over the next five years.

2. Introduction

The simulation model depicts the Tanjong Pagar Terminal when it is fully developed in 1984. There are 8 main berths and one feeder berth. The main berths are aligned along 3 wharf sections, each berth with sufficient length and depth to accommodate a third generation container ship. The feeder berth can accommodate container feeder and conventional cargo ships not exceeding 200 m in length. Ro-ro vessels with stern ramps can only be berthed at one of the main berths. The stacking yard has a capacity of 19,000 TEU ground-slots which is assumed to be adequate within the planning horizon. A layout of the Terminal is shown in Figure 1.

The mode of container handling is based on rubber-tyred gantry crane operation at the yard. Prime-mover chassis forms the inter-link between the yard and the quay cranes. The boundary of the simulation model includes the Terminal gates, the yard, the berths and the ship anchorages, but excludes the area where stuffing and unstuffing of containers takes place. The latter can be considered as extraneous to the ship-to-yard operations.

3. The Simulation Model

In developing the simulation model, ships are classified into 5 types, viz. conventional, feeder, second generation, third generation and ro-ro ships. Each type has its own arrival pattern, distribution of the number of containers handled per ship-call and crane productivity rate. The maximum number of cranes that can be deployed also varies with ship type.

As turn-round times of ships are generally in terms of hours whereas container movements in and out of the Container Terminal are in terms of minutes, the simulation of these two operations are separated in order to have a computer run that will not take up too much of computer time. Hence, two models were actually developed, one to simulate the seaward operation and the other the landward operation.

3.1 Seaward Model

This model simulates ship arrivals according to ship types, the allocation of berths and cranes, the berthing of ships, the loading and unloading of containers and the unberthing of ships. A network drawing of the model is given in Figure 2.

Upon arrival, the ship is assigned a berth depending on the ship type. Priority is given to third generation and ro-ro container ships, followed by second generation container ships, feeder ships and conventional ships in that order. If a berth is not available, the ship waits in one of the five possible queues (Nodes 8, 9, 10, 11, 12).

Having been assigned a berth, the number of cranes allocated to work the ship depends on the number available at that wharf section and on the ship type. The maximum number of cranes that can be allocated to each ship type is as follows:–

Ship Type	Maximum No. of Cranes
Conventional	2
Feeder	2
2nd generation	3
3rd generation	4
Ro-ro	4

If no crane is available, the ship queues at the respective nodes (Nodes 24–36) until one is available.

After the cranes are assigned, the ship will be moved from the mooring anchorage to the container terminal. The time spent waiting for berth and cranes and the time for berthing are aggregated as the ship's waiting time.

When the ship is alongside, it will work the number of containers it carried for the terminal using the assigned number of cranes. (The number of containers carried is a

randomly generated number based on some statistical distribution). The time spent alongside, which is termed turn-round time is calculated by the computer according to the following formula:–

$$\text{Turn-round Time} = \frac{\text{Number of Containers}}{\text{CNR} \times \text{Number of Cranes} \times \text{Average Productive Rate}}$$

where CNR = Crane Net Rate, which is the number of handled per crane per hour continuously.

After the ship has finished its cargo operation, it departs from the simulation model via one of the end Nodes 81 to 85.

3.2 Landward Model

This model depicts the movements of containers at the quayside and yard. The network drawing of this model is shown in Figure 3.

In the model, 7 quay cranes generate containers at one of the three wharf sections. The rate of container generation is dependent on some statistical distribution which is related to the Crane Net Rate. After a container is generated, it joins a queue (Nodes 2-1 to 2-7) to wait for a prime mover chassis to transfer it to the stacking yard.

The travelling time to the stacking yard for each container depends on the status of the container, which can be FCL, LCL, transhipment or empty. The container then waits (at one of the Nodes 6-20 to 6-23) for a yard gantry crane to dismount it from the chassis. Besides containers from the ship, the yard gantry cranes also handle containers from the Gates and from the Container Freight Stations. These are depicted by Nodes 12, 13 and 14.

After the dismounting operation is completed, the prime mover chassis goes back to the quay crane for the next container.

3.3 Outputs from the Models

For the seaward model, simulation runs are carried out with varying numbers of quay cranes at the three wharf sections. Each simulation run represents an operational period of one year. The following data are captured for every run:–

(i) the number of ship calls for every ship type;
(ii) the average waiting time for each ship type;
(iii) the average turn-round time for each ship type;
and (iv) the utilization rates of berths and quay cranes.

For the landward model, a simulation runs is terminated after each quay crane has generated 600 containers. The numbers of yard gantry crane and prime mover chassis are varied for each given number of quay cranes. The primary output of this model is the minimum number of gantry cranes and prime mover chassis that will allow the quay cranes to discharge containers continuously without waiting for prime mover chassis to mount the containers (that is, Queue Nodes 2-1 to 2-7 have empty queues). Other output information include utilization rates of the gantry cranes and the prime movers.

4. Calculation of Cost for an Optimum Level of Equipment Investment

Our definition of optimality is that level of equipment investment by the port which will produce the minimum aggregate of the operating costs of the port operator and the ship operators. The operating cost of the port operator includes fixed and variable costs. The fixed costs include items like depreciation of wharves, operating overheads and engineering overheads of the Terminal. The variable costs include items which depend on the number of equipment purchased (eg. manning cost and depreciation expenses of these equipment) and on the throughput of the Terminal. The costs to the ship operators are taken to be the ship waiting costs. Each ship type has a representative waiting cost per hour, the highest being that of the third generation container ship and the lowest being that of the conventional ship.

A conceptual set of calculations of the port operators' and ship operators' costs is given in Appendix I.

For higher levels of service to the ship operators, the port operator must invest in more equipment, thereby increasing his operating cost. On the other hand, at higher levels of service, the waiting times of ships will decrease, thereby reducing the ship operators' cost. The port operator's and ship operators' cost curves plotted against varying levels of equipment investment by the port operator is given in Figure 4. Also plotted is the total cost curve, which is the sum of the two curves. The minimum point of the total cost curve gives the optimum level of equipment investment for that level of cargo throughput.

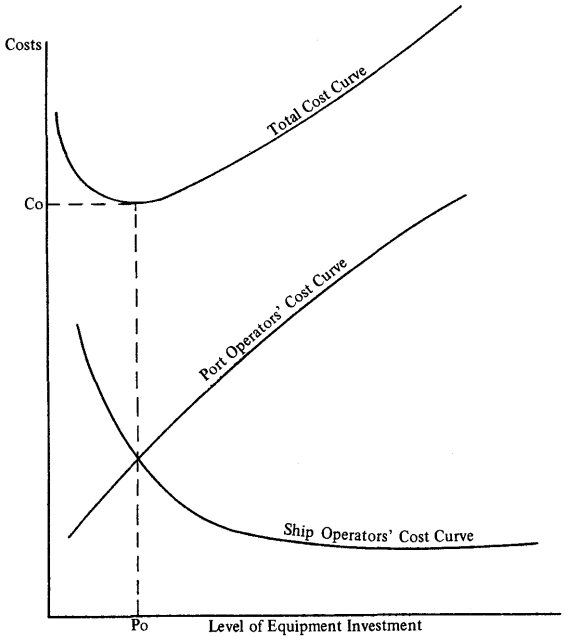


Figure 4. Optimum Equipment Investment Graph

5. Typical Simulation Results

With the two models developed, the operations of the Container Terminal may be simulated for any level of container throughput. This throughput can be varied by either increasing the frequency of ship calls or increasing the number of containers carried by each ship type.

A typical print-out of one set of forecast of ship arrival rate and numbers of containers per ship call is as shown in the following two pages.

6. Concluding Remarks

Simulation models are useful management tools for planning of future needs. This is particularly so for ports where investment in wharf and equipment facilities runs into millions of dollars. However, it must be remember that

there are inherent inaccuracies in every model. This is because certain simplifying assumptions have to be made in order to produce an artifact of the actual situation. Therefore, the user of a simulation model must recognize these assumptions and weigh their relative importance before deciding on the value of the results of the model.

FORECAST 1.2

(I) CARGO THROUGHPUT

SHIP TYPE	MEAN GRT	NUMBER OF CALLS	AVERAGE NUMBER OF BOXES/CALL	TOTAL NUMBER OF BOXES
CONVENTIONAL	8,730	283	94	26,602
FEEDER	4,554	1,376	246	338,496
2ND GENERATION	15,449	838	347	290,786
3RD GENERATION	38,714	613	710	435,230
RO-RO	14,918	22	680	14,960
		TOTAL NUMBER OF BOXES HANDLED :		1,106,074

CONVERSION FACTOR FROM BOXES TO TEUS = 1.328

TOTAL NUMBER OF TEUS HANDLED = 1,468,866

(II) EQUIPMENT UTILISATION RATES

EQUIPMENT* INVESTMENT LEVEL	QUAY CRANE	YARD GANTRY CRANE	PRIME MOVER-CHASSIS
1	0.51	0.41	0.55
2	0.47	0.39	0.52
3	0.45	0.37	0.49
4	0.43	0.35	0.47
5	0.41	0.33	0.45
6	0.40	0.32	0.43
7	0.38	0.31	0.41
8	0.37	0.29	0.39
9	0.35	0.28	0.38

(III) AVERAGE SHIP TURNROUND TIME (HOUR)

EQUIPMENT* INVESTMENT LEVEL	CONVENTIONAL	FEEDER	2ND GENERATION	3RD GENERATION	RO-RO
1	6.31	10.82	9.15	13.88	18.39
2	6.03	10.74	9.10	13.14	17.03
3	6.02	10.62	8.77	12.56	14.76
4	6.25	10.61	8.27	12.03	16.35
5	5.98	10.48	8.20	11.52	16.57
6	6.45	10.46	8.22	11.05	15.33
7	5.71	10.45	7.82	10.28	14.28
8	5.84	10.33	7.67	10.09	14.14
9	5.77	10.36	7.32	9.91	13.83

(IV) AVERAGE SHIP WAITING TIME (HOUR)

EQUIPMENT* INVESTMENT LEVEL	CONVENTIONAL	FEEDER	2ND GENERATION	3RD GENERATION	RO-RO
1	4.67	3.72	3.03	2.70	6.36
2	3.67	3.15	2.59	2.47	4.08
3	4.05	3.18	2.62	2.39	3.51
4	3.38	2.77	2.26	2.18	5.21
5	3.28	2.80	2.25	2.16	4.11
6	3.38	2.62	2.12	2.04	5.03
7	3.26	2.45	1.97	1.89	3.37
8	3.26	2.46	1.89	1.86	2.71
9	2.94	2.34	1.82	1.88	2.59

(* THE NUMBERS OF QUAY CRANES, YARD GANTRY CRANES AND PRIME MOVER-CHASSIS FOR EACH EQUIPMENT INVESTMENT LEVEL ARE GIVEN IN APPENDIX II.)

Appendix I: Conceptual Cost Calculations

(I) Port Operating Costs

Let:–

(i) Terminal Fixed Cost (operating overheads, engineering overheads) = CT

(ii) Fixed Cost of Equipment i (depreciation, manning cost, insurance) = FC_i

(iii) Operating cost of Equipment i (running, repair and maintenance cost per hour of operation) = OC_i per hour

(iv) Revenue Tax = RT

Then:–

Annual port operating cost

$$= CT + \sum_{i=1}^{3} (FC_i + n_i * OC_i * \mu_j * 365 * 24) + RT$$

where n_i = number of equipment i
= utilization rate of equipment i

and i = 1 denotes quay cranes
i = 2 denotes yard gantry cranes
i = 3 denotes prime mover chassis

(II) Ship Waiting Cost Per Hour

Let j denotes ship type as follows:–
j = 1 for conventional ship
j = 2 for feeder ship
j = 3 for second generation ship
j = 4 for third generation ship
j = 5 for ro-ro ship

Appendix I (2)

Let:–

(i) Annuity cost of ship type j (depreciation of ship, cost of capital) = AS_j

(ii) Container set annuity cost of ship type j (depreciation and cost of capital of pre-determined number of containers per ship) = AC_j

(iii) Annual fuel cost of ship type j = F_j

(iv) Annual wage and benefits of crew ship type j = C_j

(v) Annual repair and maintenance cost of ship type j = RM_j

(vi) Annual insurance cost of ship type j = I_j

(vii) Other operating costs of ship type j = X_j

Assuming a ship is operational for 350 days in a year, then waiting cost per hour of ship type j = WC_j

$$WC_j = \frac{AS_j + AC_j + F_j + C_j + RM_j + I_j + X_j}{350 \times 24}$$

Appendix II: Definition of Various Levels of Equipment Investment

Level of Equipment Investment	Number of Quay Cranes	Number of Yard Gantry Cranes	Number of Prime Mover Chassis
1	18	45	72
2	19	48	76
3	20	50	80
4	21	53	84
5	22	55	88
6	23	58	92
7	24	60	96
8	25	63	100
9	26	65	104

Fig. 1

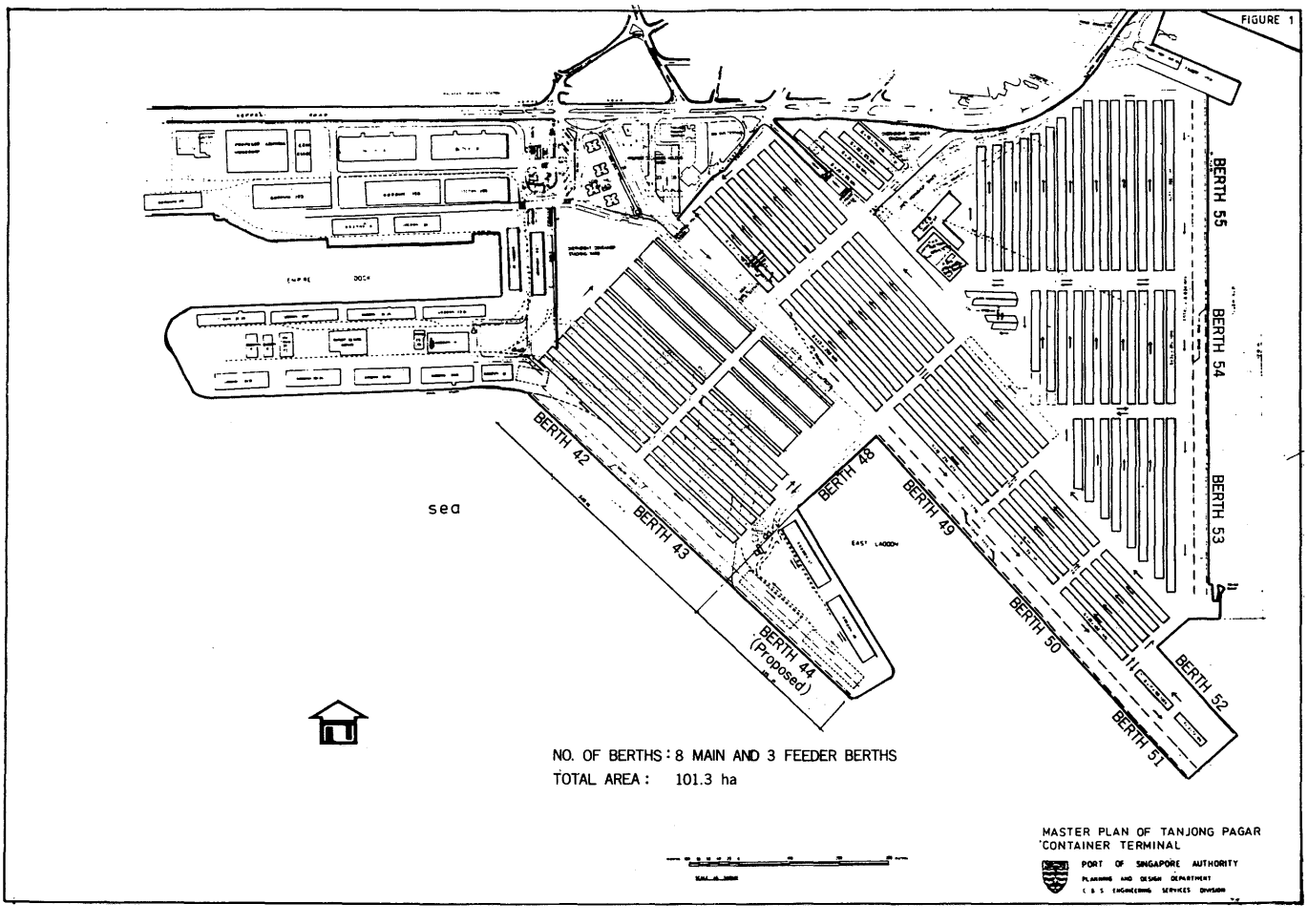
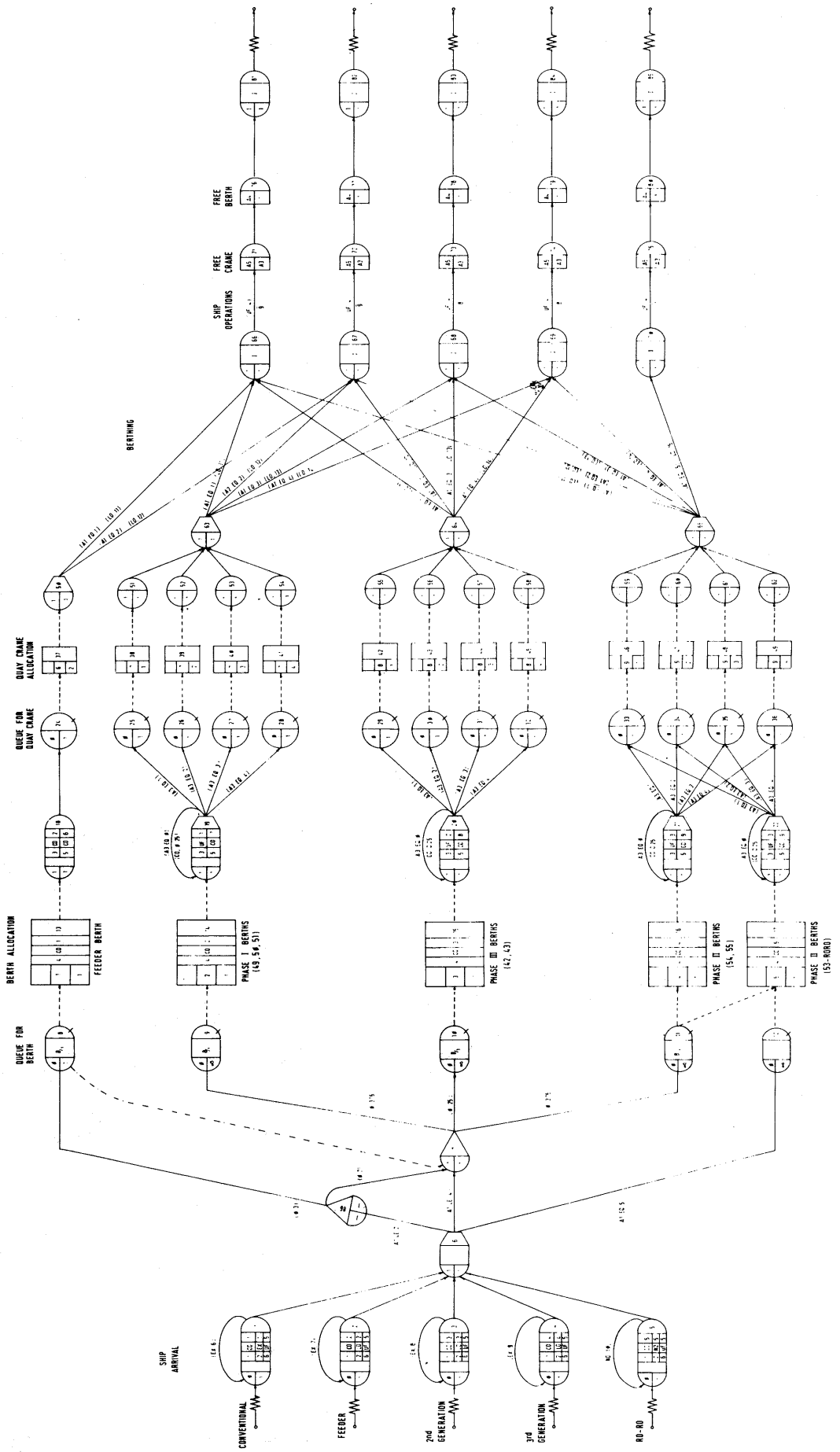


Fig. 2 Q - GERT MODEL OF SEA - SIDE OPERATIONS AT CONTAINER TERMINAL



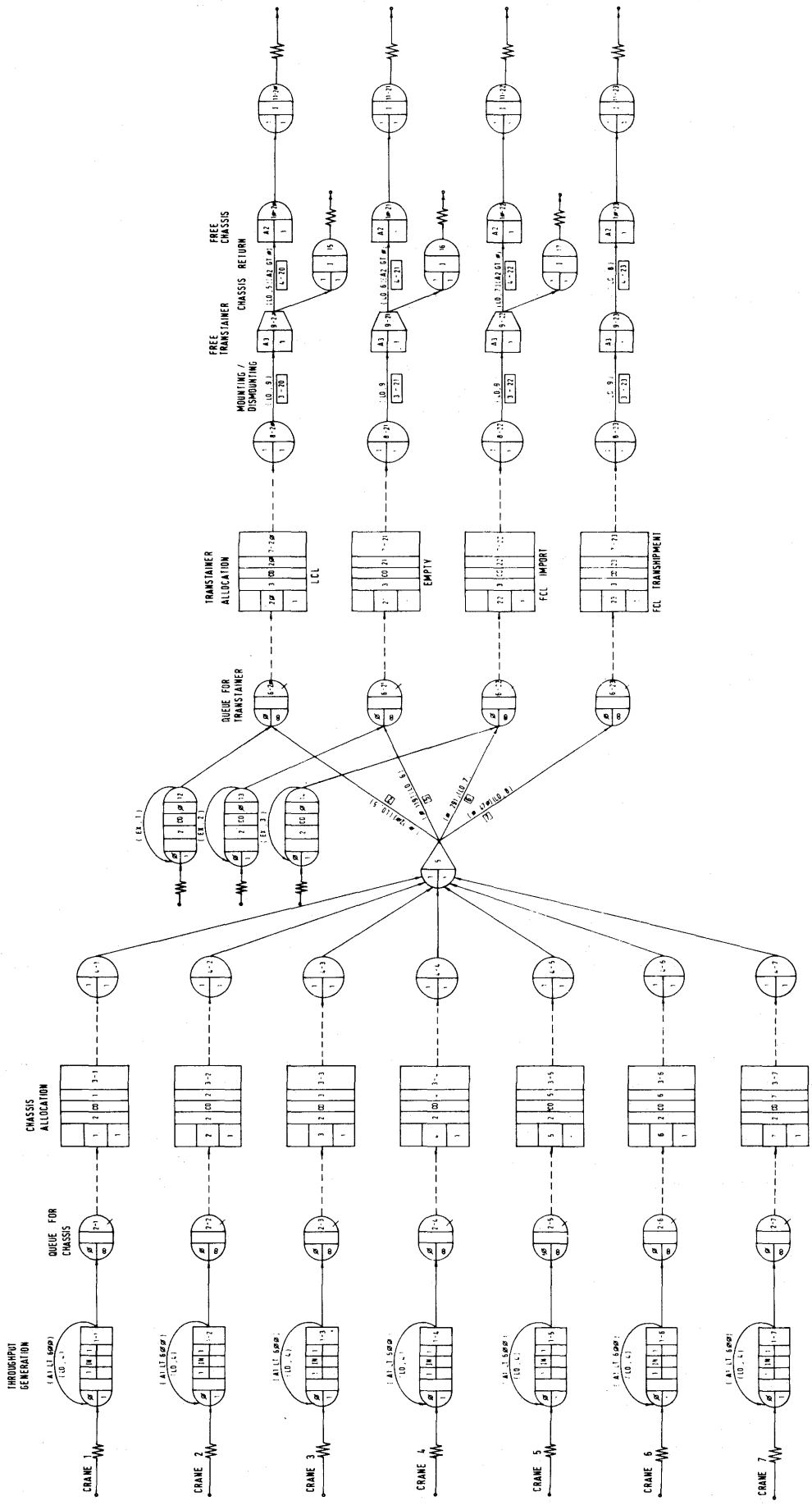


Fig. 3 Q - GERT MODEL OF LAND - SIDE OPERATIONS AT CONTAINER TERMINAL

Port of Mombasa — Gateway to East Africa

By Robert H. Wardwell, Senior Economist, and David A. Veshosky, Engineer, The Marine Group, CE MAGUIRE, INC.

It was an interesting assignment: East Africa, Kenya, and development in the Port of Mombasa. Under contract to the Trade and Development Program, U.S. State Department, a team of consultants from CE Maguire, Inc., Investigated the activities and development prospects in Kenya's Port of Mombasa. Some 25 meetings were held with officials of the Kenyan Government, the Kenya Ports Authority, and the Kenya Cargo Handling Service, as well as leading private maritime professionals. Shoreside and harbor tours allowed complete access to facility operations, traffic flow procedures, and port expansion possibilities. The following is a summary of our observations.

Strategic Location

Many variables define a port. Hinterland characteristics, port services, intermodal connections, competition, and frequency of vessel calls are all important factors affecting a port's trade. However, the primary element that defines a port's business remains its geographic location. The Port of Mombasa is strategically located in East Africa and its importance as a gateway is reflected by its handling of 65 percent of the region's annual international waterborne commerce.

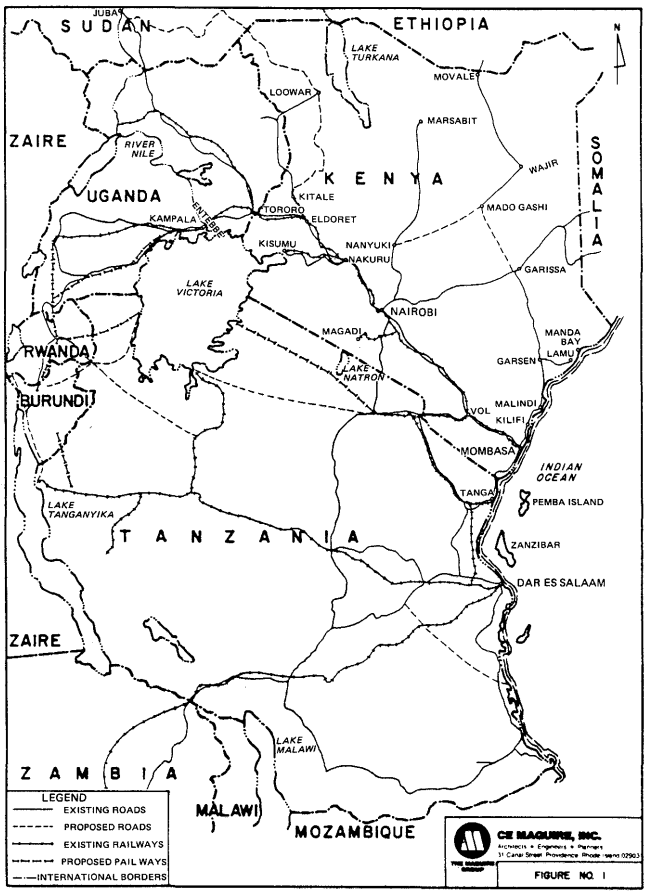
Figure 1 depicts Mombasa's location on the Indian Ocean. Only the Tanzanian port of Dar es Salaam is available for alternative routing and, then, only for shippers to the south of Kenya. The figure also illustrates the rail and road links from Mombasa to the commercial center of Nairobi, as well as the landlocked countries of Uganda, Rwanda, Burundi, Zaire and southern Sudan.

The economies of Mombasa's hinterland countries are both similar and individually distinct. On the one hand, each of these East African countries depends upon agriculture for subsistence and foreign exchange earnings. The stability and open foreign investment policy of Kenya, on the other hand, are in sharp contrast to the political and economic upheaval that still affect life in post-Amin era Uganda. Nevertheless, the business of the Port of Mombasa reflects these regional economies as coffee, tea and other agricultural products represent primary exports and total trade volumes fluctuate in accordance with the ebbs and flows of regional governments and industries.

Port Facilities

The modern Port of Mombasa has grown up in Kilindini Harbor, on the south side to Mombasa Island, and in recent years has spread into Port Reitz at Kipevu on the West Mainland. Figure 2 illustrates the layout of port facilities in Mombasa.

The existing port complex in Kilindini Harbor stretches from the bulk cargo handling facilities at Mbaraki Wharves, near the harbor entrance, westward across Makupa Creek to the crude oil import terminal at Kipevu. The majority of the port area consists of a series of marginal wharves with relatively narrow aprons and back-up areas, reflecting the handling and storage practices of breakbulk general cargoes,



the presence of numerous rail sidings, and the existence of sharply sloping terrain immediately behind the port.

Sixteen berths along the marginal wharves accommodate general cargoes. With berths 16, 17 and 18 recently designated as a container terminal, the remaining berths 1 through 14 (with a gap at berth 6) are equipped for breakbulk general cargo operations. Other facilities in Kilindini Harbor include: the bulk handling quay at Mbaraki, the Liwatoni Fish Quay, drydock and ship repair facilities, lighter wharves, and two oil terminals. Conventional breakbulk operations remain the principal mode of cargo handling in Mombasa. Labor gangs, assisted by numerous 3 to 5 ton mobile cranes and ships' gear, handle bags, crates and other non-unitized loads. Figure 3 depicts a typical breakbulk cargo vessel being unloaded with the aid of both shoreside and ship's gear.

Bulk cargo loading procedures offer an interesting contrast to the dominant breakbulk operations. Loading and storage facilities for export soda ash, for example, illustrate an innovative adaptation of cargo handling technology to a limited land area. As shown in Figure 4, conveyor belts carry soda ash from storage sheds located on top of a bluff over rail and road to an adjacent conventional breakbulk berth for vessel loading. The Mbaraki wharves provide service for Bamburi Cement Company. A special loading device for cement is visible on the apron, while vessel grab buckets unload coal or gypsum through hoppers into waiting lorries. During our visit, numerous trucks were lined up to receive gypsum at a rate of approximately 1,500 tons per day. The routine receipts of coal reflect the recent

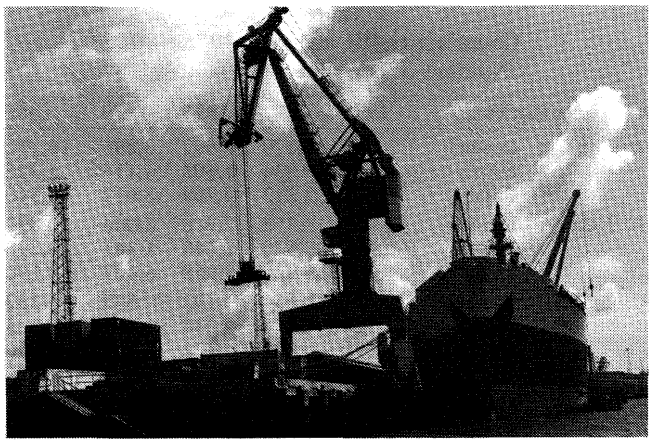


Fig. 3 Breakbulk cargo vessel being unloaded with the aid of both shoreside and ship's gear.

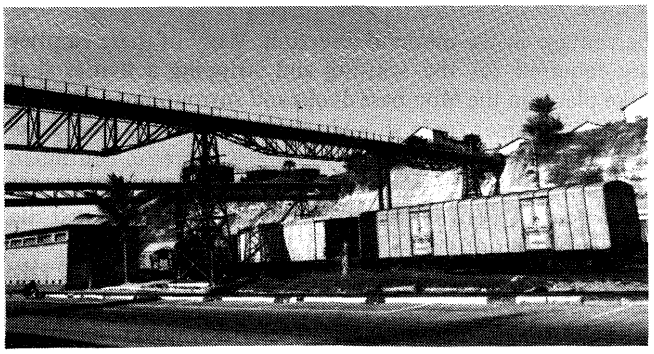


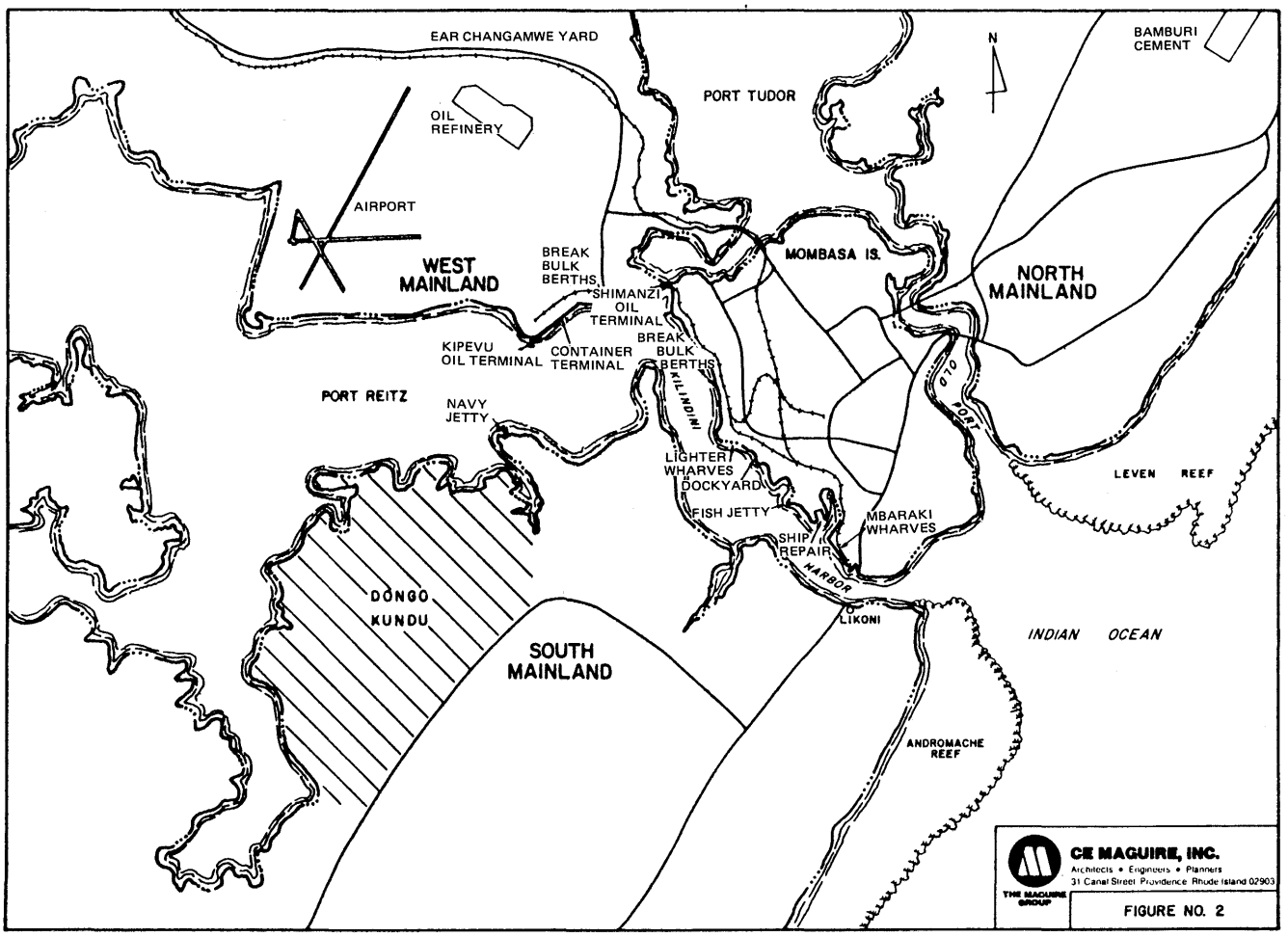
Fig. 4 Conveyor belt for soda ash

conversion to coal fired generation of the Bamburi Cement plant near Mombasa.

Easily, the most obvious new development in Mombasa's cargo handling is the pervasive and rapid conversion of general cargoes into containers, mostly twenty-foot boxes. These are carried on multi-purpose self-unloading vessels and handled with ships' gear at virtually all the general cargo berths. Containers, temporarily stored on narrow aprons, were evident at most berths. The dedicated container terminal at berths 16, 17 and 18, however, did accommodate most of the growing container traffic. A single versatile container crane services this terminal, which is supported by a 50 acre open storage area. A floating crane is also utilized at this facility, as is ship's gear. Continual berth occupancy was evident during our tour. Trucks carry most containers inland, while the capacity of the railway remains dedicated to bulk commodities and conventional breakbulk cargoes.

Maritime Commerce

Approximately 7.5 million tons of waterborne commerce passed through the marine facilities in Mombasa during 1980. The total volume has fluctuated over the past five years and the 1980 tonnage represents a high level. Significant volumes of imported grain and continual high volumes of petroleum are reflected in the 1980 tonnage. Overall, the trade reflects a depressed regional economy. The troubles in Uganda have severely altered tonnage levels to and from this particularly fertile country. Additionally, escalating oil prices and adverse weather conditions have worsened foreign exchange problems which in turn have encouraged the institution of national import substitution policies by



Kenya.

Coffee remains the primary export commodity through Mombasa. Generated from virtually all of the hinterland countries, coffee, tea, and other agricultural produce reach world markets through Mombasa. Other important general cargo exports include soda ash in bags, tinned fruits, vegetables and juices, and cement in bags. Bulk cargo exports consist predominately of bulk cement, fluorspar, and bulk oils. In 1980, over 2 million tons of cargo were exported through Mombasa.

As in many countries, petroleum was the principal import cargo, with over 3 million tons accommodated in 1980. Iron and steel, fertilizer in bags, and vehicle tires and spare parts were the most important general cargo imports. Coal and gypsum are significant dry bulk imports, with wheat and maize also being highly important dry bulk imports in 1980.

Table 1
Traffic handled at the Port of Mombasa
(Thousands of deadweight tons)

	1976	1977	1978	1979	1980
General Cargo	1,780	2,000	2,076	1,896	2,215
Dry Bulk	727	853	894	750	1,231
Bulk Liquids	3,381	3,078	3,101	3,296	4,066
Total Exports	1,970	1,168	1,800	2,078	2,037
Imports	3,908	3,954	4,267	3,859	5,472
Grand Total	5,888	5,931	6,071	5,942	7,512

Source: Kenya Ports Authority

A five year trend analysis of total cargoes, including transshipments, is presented in Table 1. Similar cargo mixes have continued through mid-year 1981. In fact, despite the depressed regional economy, and in some cases because of it, the total cargo handled at the Port of Mombasa rose by 20.87 percent from 1.9 million tons in the second quarter of 1980 to 2.3 million tons in 1981. While traditional export cargoes of coffee, tea, and soda ash decreased during the second quarter of 1981, exports of bulk oil for bunkers and bulk imports of sugar and maize displayed significant increases over 1980.

The rapid penetration of containers as an element of the traffic mix in Mombasa is clearly revealed in cargo statistics. Table 2 presents the annual handlings of containers since 1976. The increase has been truly substantial, with the number of TEUs (twenty-foot equivalent units) handled doubling almost annually between 1977 and 1980. It should also be noted that Mombasa is reflective of many ports in developing countries, as containerization continues to grow worldwide. The December, 1981, issue of Containerization International, for example, reported that while the number of containers handled worldwide increased 14.1% from 1979 to 1980, containers accommodated throughout Africa increased by over 30 percent in that one-year period.

Exports of coffee, tea and canned fruits, and imports of chemicals, bagged fertilizer and ironware have been containerized in the Mombasa trade. Estimates indicate that approximately 15 percent of potentially containerizable cargoes were handled in boxes in 1979-1980. The balance between export and import containers is attractive, with an even split between directional flows of the 21,536 loaded containers handled in 1980. Approximately one-third of containers handled in 1980 were empty, with a higher

Table 2
Container traffic analysis: 1976–80
Number of containers (by status)*

Container Particulars		1976	1977	1978	1979	1980
A. Imports	Loaded	1,019	1,479	2,907	3,896	10,312
	Empty	588	834	1,802	4,116	5,228
	Total	1,607	2,313	4,709	8,012	15,540
B. Exports	Loaded	1,452	1,358	2,718	5,066	10,892
	Empty	176	570	1,240	1,341	3,298
	Total	1,628	1,928	3,958	6,407	14,190
C. T/Ment	Loaded	74	154	192	572	332
	Empty	124	235	234	194	323
	Total	198	389	426	766	655
D. Total	Loaded	2,545	2,991	5,817	9,534	21,536
	Empty	888	1,639	3,276	5,651	8,849
	Total	3,433	4,630	9,093	15,185	30,385

*Approximately 95 percent are 20' boxes.
Source: Kenya Ports Authority

percentage in the inbound direction. Many of these empties are required for the stuffing and stripping activities that take place on the Mombasa docks and surroundings. Growth in the container trade should continue. In fact, during the first half of 1981, the trend in container traffic continued upward with the number of TEUs handled increasing by 45.2 percent between the second quarter of 1980 and the similar quarter of 1981.

Outlook

Two major issues confront the Mombasa maritime community. The first involves the impact of continued containerization on the port and intermodal infrastructure of this developing country. The second is the lack of suitable waterfront land for large scale port development and related industrial expansion.

The introduction and increased use of containers has affected facility, equipment and infrastructure requirements, as well as documentation, management and control procedures, in virtually every port in the world. Ports in industrialized countries have been adapting to containers and intermodalism for twenty years. Until recently, developing countries have not provided port facilities for large volume container movements and, therefore, have not encountered the related pressures for systems-wide change. Increased containerization in Mombasa presents the following challenges:

High Capital Investment: Mombasa is a labor–intensive port with limitations on financing major port development. Attraction of monies from other countries and international lending agencies is required to finance needed and expensive infrastructure improvements.

Appropriate Technology: The Kenya Ports Authority provides housing and work for hundreds of port laborers. Socio-political problems connected with a shift in the mix of capital and labor, and the need for training and retraining must be resolved. A balance between national policies and the needs of international shippers will be crucial to continued increases in container throughput.

Inland Transportation: Most containers are presently carried by trucks. Road systems in Kenya were not designed to accommodate containers and may encounter safety and maintenance problems. While the Kenya

(Continued on page 22 bottom)

The First Banker

Early in man's history, he learned to specialise. A man that did his best work with a hammer became a carpenter. The one that grew the biggest vegetables became a farmer. And goods and services were traded.

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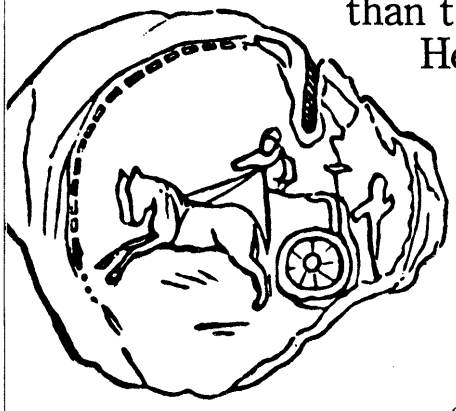
Today's world is more complex than that of the first banker. He did his best to help then. We do our best to help now.



FUJI BANK
Tokyo, Japan

Port Muhammad Bin Qasim
First Industrial & Bulk Port of Pakistan

By Port Qasim Authority

On 14th August 1947 Pakistan emerged as an independent and separate state on the map of the World. As a sovereign state it required to steer out of the economic backwaters of the region into the mainstream of socio-economic uplift and progress. Transportation sector being the vehicle of economic development, the only Port of Pakistan, i.e. Karachi, was subjected to increasing stress with economic expansion. The resulting ever-widening gap between requirements and availability of port facilities at Karachi necessitated the search for the site of 2nd major Seaport of Pakistan. The preliminary maritime surveys and investigations carried out in late sixties, the subsequent reports of international institutions and agencies in early seventies and the decision to site the first Steel Mill of Pakistan at the present location preceded the decision of setting PQA (Port Qasim Authority) by an Act of Parliament on 29 June 1973 to plan, design, operate and maintain the 1st Industrial and Bulk Cargo Port of Pakistan at its present site situated about 50 kilometers Southeast of Karachi Port in Phitti Creek System.

Port Qasim Project is unique as an exercise in port development as it has been constructed literally on "green field". Sandy dunes of semidesertal landscape and the Creek System forming centuries ago the mouth of the mighty Indus River before falling into the Arabian Sea, are now being replaced by the industrial environment of a modern port.

Port Qasim is situated 50 kilometers away from the centre of the city of Karachi. National Highway and main railway line link it with the hinterland and the cargo originating from or destined to up country will have a saving in cost and time of transportation. All the supply lines such as for water, power, gas and communication run close by. Its operation would provide environmental relief to the city of Karachi by easing congestion on roads and pollution in the air and would substantially contribute to the regional development.

Once the basic infrastructure essential for launching the development of a major new port was in position, the construction of major works constituting the hardware of the project started in the 2nd half of 1977.

The 1st Phase of the project which is expected to be completed by 1983-84 can be described as follows:

Iron Ore & Coal Berth:

A specialised heavy duty berth was completed in July 1979 to handle the imports of raw materials required by a one-million tons capacity Steel Mill located in the vicinity of Port Qasim. The main berth is 279 metre long and 21 metre wide mounted on a pipe pile foundation. A conveyor belt of 4.5 Kilometers in length runs upto the iron ore and coal stock yards of Pakistan Steel Mill. The piled structure

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(Continued from page 20)

Railway does transport some containers between Mombasa and Nairobi, there appears to be a lack of adequate rolling stock and container handling equipment. The inland transportation system, particularly railways, must catch up with container handling improvements already implemented in the port.

Documentation: Corresponding improvements in paperwork and information processing must support infrastructure improvements. Coordinated documentation remains an obstacle to intermodalism, even in many developed countries. Some changes in existing documentation procedures will be required in order to adapt to containerization of additional general cargoes.

The Kenya Ports Authority and users of the port are well aware of the challenges of containerization, and a National Committee on Containers has been formed to develop a coordinated response. The committee includes officials of the KPA, KCHS, Kenya Railways, Kenya Customs and Excise Department, and representatives of shipping, freight forwarding, and trucking companies. KPA officials recognize that increased containerization may create problems for the Port of Mombasa and supporting transport systems, and remedial actions are in process. Three new container cranes will soon be added to the container terminal, and three inland consolidation centers, including one in Nairobi, are under construction. Computer systems to inventory and control container movements in the port are planned. These actions should allow the Port of Mombasa to provide adequate and improving container service for the immediate future.

Beyond that, limited financial resources warrant a cautious approach to development that is in the interest of Kenya and port users.

The second major issue facing the Port of Mombasa is the lack of suitable land for port expansion and the development of port-related industry. Expansion of the existing port at Kilindini is limited by topography, adjacent development and lack of uncongested transportation access. KPA plans have identified the development of a portion of the South Mainland, the Dongo Kundu area, for a port industrial zone and bulk cargo terminals, particularly for coal and grain. As illustrated in Figure 2, a crossing at the western portion of Port Reitz would be required for large scale utilization of the Dongo Kundu region. The KPA owns this land and is optimistic about its importance to facilitate regional economic growth. National policies regarding the conversion of utilities and other major users to coal could create immediate pressure on existing bulk terminals and enhance the priority of development at Dongo Kundu.

Overall, the outlook for the Port of Mombasa is cautiously optimistic. Although the port is faced with serious challenges in the years ahead, the Kenya Ports Authority and the Kenya Cargo Handling Service have well-trained, highly professional staff familiar with issues and trends in the maritime industry. Problems exist and will continue to arise, but the Port of Mombasa appears able to respond to these problems with approaches which are appropriate for a developing country and with the assistance of port users and the international community.

of the berth is designed to allow the present depth of 12.8 metres alongside to accommodate 50,000 dwt. vessels to be deepened when required to accommodate 50,000 dwt. ships. The planned annual throughput across this berth is 3.36 million tons. This berth has been in operation since September, 1980.

Multipurpose Terminal:

The construction of a Multipurpose Terminal comprising of 7 berths of a total length of 1,400 metres also started in the 2nd half of 1977. This is the Ports main operating area with all the associated infrastructure of warehouses, gates, railway sidings, roads, services, equipment, etc. These berths of linear design run along the edges or margin of the Creek and they are joined to the mainland by a Causeway carrying the road, railway and essential services. Each berth has 300 metre wide back-up area from the berth surface. Berth Number 2 and berth Number 4 will have transit sheds of 100,000 sq. ft. each set back 30 metres from the berth face. Berths 1-4 will be completed by September 1982 with a water depth alongside for fully laden ships of 25,000 dwt. The remaining 3 berths would be completed by the end of the current year with one metre deeper water alongside to accommodate ships of 35,000 dwt. Whilst the general cargo of the country would continue to be handled as now at Karachi Port, bulk and homogeneous cargo such as rice, wheat, cement, fertilizers and their raw materials and the exports and imports of Pakistan Steel other than iron ore, coal, etc. carried in ship loads will be handled at the Multipurpose Terminal. These berths are expected to handle 3 to 5 million tons of cargo annually. With the introduction of higher degree of mechanisation or installation of bulk handling facilities the annual throughput can be considerably raised.

Navigable Channel:

The berths at Port Qasim are approached from the sea through a 24 nautical miles long channel which provides a minimum depth of 12.4 metres upto the Iron Ore & Coal Berth and 11.0 metres from there upstream to the Multipurpose Terminal. The outer channel, with a depth of 12.4 metres provides access to ships of 50,000 dwt. in fair weather, is marked by lighted buoys at 1 nautical mile intervals. The width of the channel ranges between 180 metres to 220 metres.

All these hard-core facilities are being supplemented by necessary floating draft, navigation aids, communication systems, supply lines, rail and road system, commercial area, administrative and residential facilities, repair & maintenance facilities with other necessary infrastructure, as required by a modern port, to be completed by 1983–84.

Port Qasim has an area of 12,000 acres. It is the intention of PQA (Port Qasim Authority) to develop this land for siting maritime-biased economic activities which in turn would generate cargo for Port Qasim. This area would be used for location of the primary industries that need to be situated adjacent to a deepwater port and for the secondary sets of industries that serve the primary industries. The 1st Export Processing Zone is being developed in the neighbourhood of Port Qasim. Similarly engineering industry has substantial potential for development once the Steel Mill is in full operation. These factors combined with the vast areas and modern port facilities at Port Qasim will determine the contribution of Port Qasim to the national economy in the years ahead.

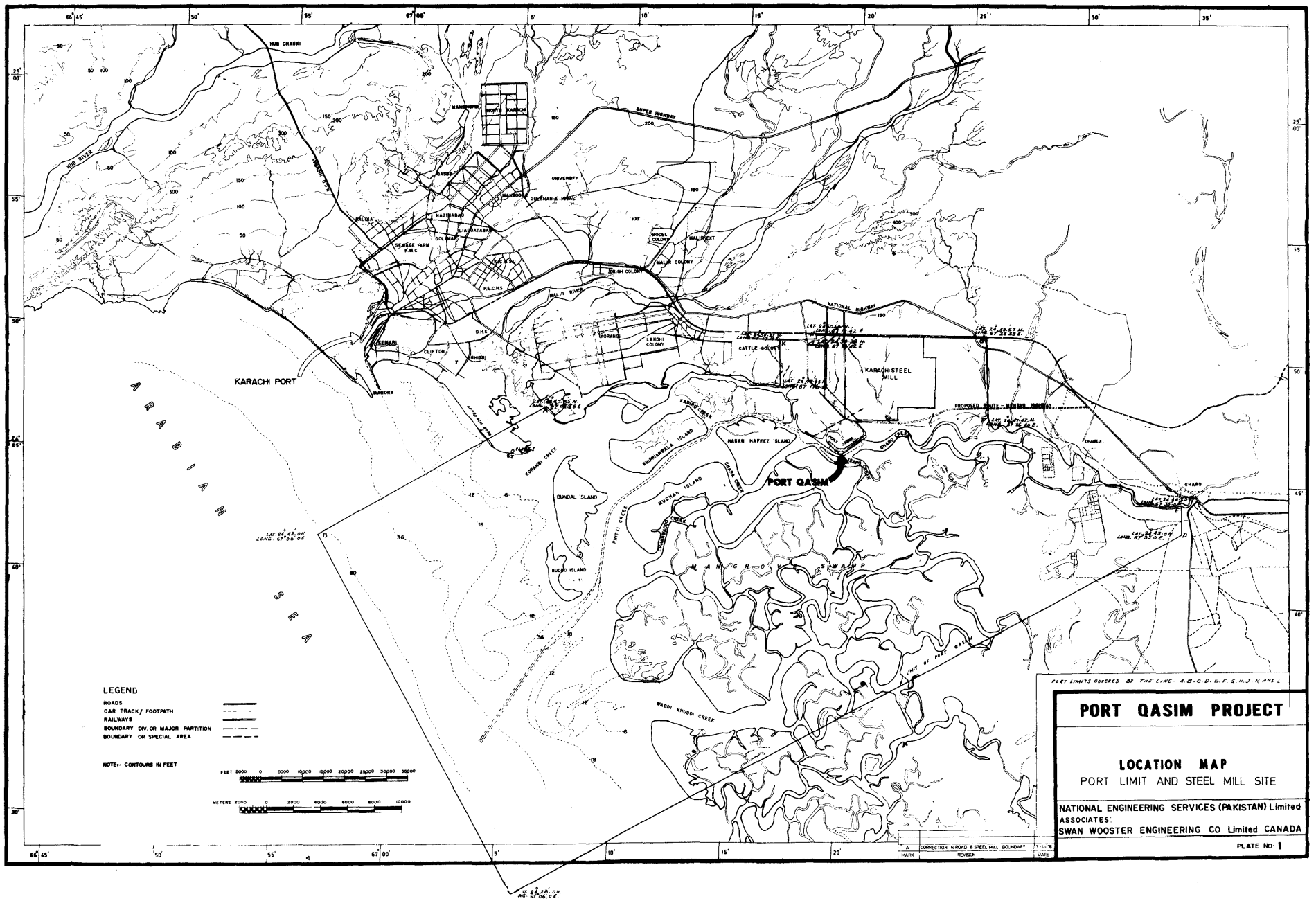
Project Cost:

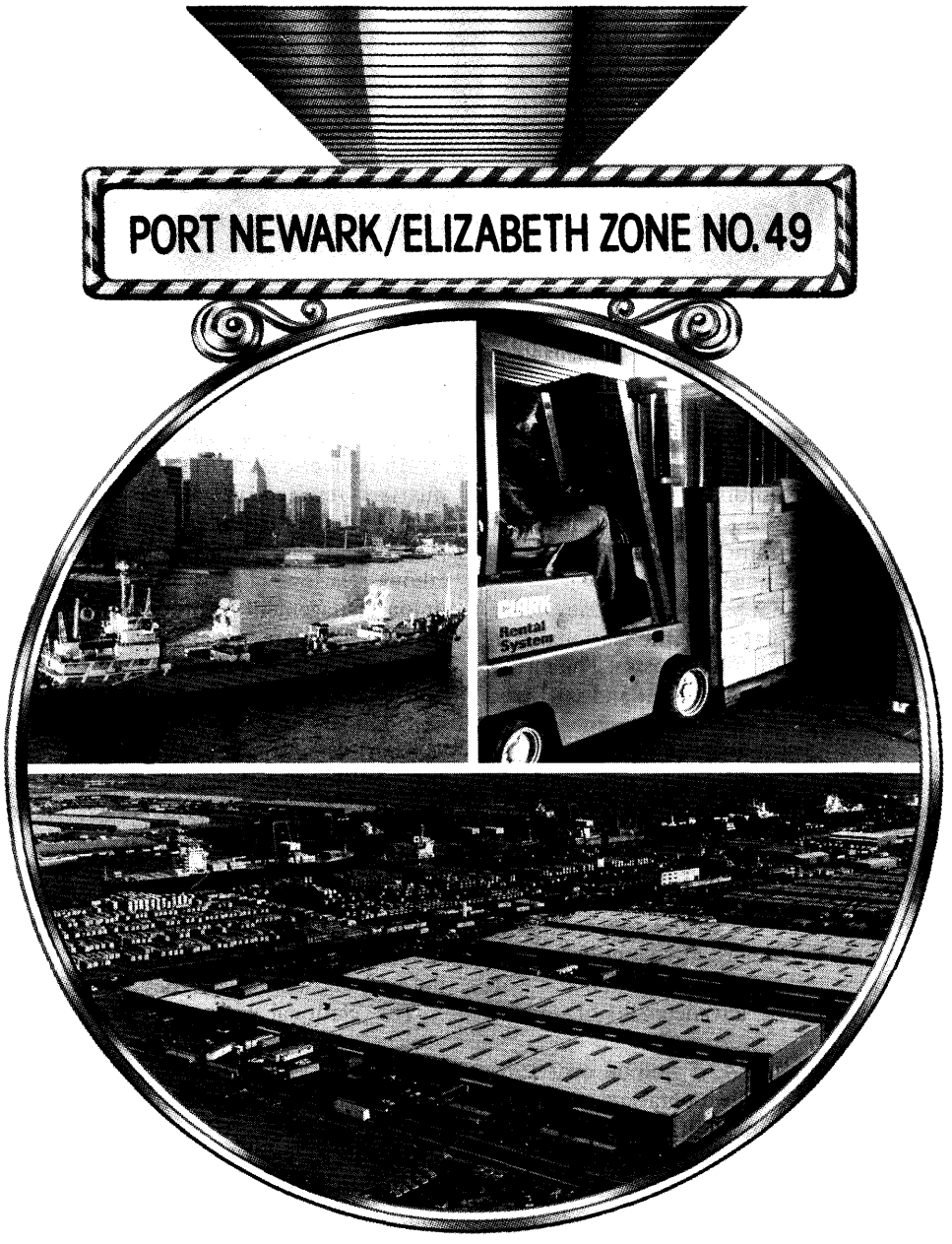
The estimated cost of the 1st Phase of the project at current prices is Rs.5492 million (1 U.S.$ = Rs.11.60). This cost is composed of 60% equity of the Government of Pakistan and 40% loan capital in foreign exchange.

Operational Strategy:

A port can come up to the mandate given to it in the national economic context only when it can ensure financial viability and operational efficiency. In an entirely new port where about 90% of the annual cost incurred is of fixed nature, the objective can be achieved when maximum utilization is made of the port facilities. This calls for devising a corresponding operational strategy. PQA's operational strategy is intended to optimise and capture the benefits of Port Qasim to the national economy through maximisation of efficiency.

PQA's operational strategy in the formulative stage seeks to harness the direct involvement of the port users and beneficiaries so that they have a direct stake in achieving the highest level of performance in terms of tons throughput per berth per annum. The relative advantages of physical features, shorter distance to up country, deeper draft, open layout of the port facilities and large areas, the incentive-based-operational systems at Port Qasim combined with the expertise in the private sector of stevedoring, forwarding, warehousing and shipping seem to be a reasonable basis for such a strategy. The concept combines public ownership of assets with private management of cargo operation, i.e. from ship's hold to the delivery to consignee and vice versa. PQA will have the overall responsibility for port operation and Authority will itself carry out the marine operations and be responsible for safety and security in the port. The Cargo Handling Companies from private sector to be selected through open competition, would provide complete terminal services to cargo carrying responsibility for implementation, supervision and management of the entire cargo operation. PQA will define the cargo handling methods to be applied and set the cargo throughput targets to be achieved for different commodities. The rates payable by cargo for this handling are designed to reflect the genuine cost of labour, equipment, overheads and mark-up for entrepreneurial effort of the Company.


KARACHI PORT
PORT QASIM
KARACHI STEEL MILL
ARABIAN SEA
HUB CHAUKI
HUB RIVER
SUPER HIGHWAY
NATIONAL HIGHWAY
MALIR RIVER
KORANGI CREEK
PHITTI CREEK
BUCHAR ISLAND
BUNDAL ISLAND
BUDDO ISLAND
HASAN HAFEEZ ISLAND
KHIPRIANWALA ISLAND
MANGROVE SWAMP
WADDI KHUDDI CREEK
LIMIT OF PORT BASIN
PROPOSED ROUTE - MEHRAN HIGHWAY
GHARO
KEAMARI
CLIFTON
MANORA
LEGEND
ROADS
CAR TRACK / FOOTPATH
RAILWAYS
BOUNDARY DIV. OR MAJOR PARTITION
BOUNDARY OR SPECIAL AREA
NOTE:- CONTOURS IN FEET
PORT LIMITS COVERED BY THE LINE- A-B-C-D-E-F-G-H-J-K AND L
PORT QASIM PROJECT
LOCATION MAP
PORT LIMIT AND STEEL MILL SITE
NATIONAL ENGINEERING SERVICES (PAKISTAN) Limited
ASSOCIATES:
SWAN WOOSTER ENGINEERING CO Limited CANADA
PLATE NO: 1
A CORRECTION N.ROAD & STEEL MILL BOUNDARY 3-4-'82
MARK REVISION DATE



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National Harbours Board

(Extracts from National Harbours Board 1981 Annual Report, Canada)

Chairman's message(extract)

In 1981, the National Harbours Board continued its pursuit of financial viability. Despite the generally depressed level of the economy, the Corporation achieved record results in the year just ended. Its operating revenues rose 19% over 1980 while its net income increased from $17.4 million in 1980 to $59.8 million in 1981.

It was very enocouraging to repeat the positive performance of 1980 since prior to that date, the National Harbours Board had a long history of annual losses. The results indeed reflect the dedication of management and staff who are now witnessing the effects of both the customer-service orientation and the planning and control measures implemented in the past few years. While 1981 represents the second consecutive year that the National Harbours Board has realized a positive net income, it is the fifth consecutive year that the Corporation has improved its operating results. The National Harbours Board faces the continuing need to generate funds in order to ensure the continuity of its ports. It is through the timely introduction of new facilities and the replacement of used assets that the Corporation expects to promote the advancement of international trade.

The increase in net income of $42.5 million over 1980 must be put into perspective. While operations did generate approximately $12 million in additional net income, the majority of the increase is due to large favourable shifts in both interest income and interest expense. Interest income increased by approximately $10 million over 1980 as a result of an increased investment base and higher yields. Interest expense decreased by approximately $18 million from the 1980 level as a result of the reorganization of the Corporation's debt, which became effective on January 1, 1981.

I am particularly pleased to report that for the first time in the history of the National Harbours Board, all fifteen ports recorded a positive net income. This compares to only nine of fifteen ports which attained positive results in 1980. Thirteen of the fifteen ports improved their bottom-line performance in 1981. The excellent results are due, in large part, to the efficiency of the National Harbours Board staff throughout the system who have handled the workload despite a marginal reduction in total manpower.

During 1981, the National Harbours Board placed an emphasis on staff development and modifying its organization structure to meet the challenges of the future.

The National Harbours Board held its first Senior Port Management Course in October. For eleven days, a group of 25 senior managers from National Harbours Board ports, Harbour Commissions and the Canadian Marine Transportation Administration of Transport Canada met to exchange ideas with marine experts from Canada, the United States and the United Kingdom. This program was intended to enable management to deal more effectively with such issues as the changing environment, sophisticated technology, altered shipping patterns and increased competition. This course will become an annual event.

An in-depth study of the role and organization of headquarters resulted in changes to the organization which should improve the internal decision-making process.

The National Harbours Board experienced a favourable labour relations climate in 1981. As a result of a positive union/management attitude, only a minimal number of person days were lost as a result of the one strike which did occur. While not directly employed by the National Harbours Board, the stevedores once again provided the ports with the labour stability required to achieve record results. The positive climate has resulted largely from the mutual trust developed between National Harbours Board management, the Maritime Employers Associations and the various unions.

During the year, the Corporation embarked upon energetic development plans which resulted in capital expenditures of $65 million. Approximately two-thirds of the funds provided by operations were channelled back into the Corporation in the form of capital expenditures.

The National Harbours Board's involvement in one project in particular reflects the innovative nature of its employees. During 1981, the Corporation committed itself to a joint undertaking with private industry, at the Port of Prince Rupert. As part of the development of a bulk coal facility at Ridley Island, the National Harbours Board will contribute $23.0 million as its equity share of Ridley Terminals Inc., a corporation formed with Federal Commerce and Navigation Ltd. to construct and operate the terminal facilities.

Pierre A.H. Franche,
Chairman

Highlights

(000's except for return on fixed assets employed and employee data)

	1981	1980
Financial Results		
Operating revenue	$ 180,833	$ 151,967
Net income	$ 59,848	$ 17,360
Funds provided by operations	$ 71,463	$ 57,319
Return on fixed assets employed	8.2%	2.5%
Financial Position at Year End		
Working capital	$ 107,231	$ 161,121
Total assets	$ 682,255	$ 620,102
Long-term liabilities	$ 528,994	$ 529,801
Capital Expenditures	$ 65,049	$ 37,860

Traffic		
Total metric tonnage through NHB ports	160,500	163,000
Employees		
Average number of employees	1,766	1,777

Statement of income and deficit

for the year ended December 31, 1981 ($000's)

	1981	1980
Revenue		
Harbour services	$ 45,040	$ 37,675
Grain services	29,038	25,993
Cargo handling services	58,426	47,261
Rentals	30,362	27,095
Shipping services and other	17,967	13,943
	180,833	151,967
Expenses		
Salaries and employee benefits	48,340	42,645
Purchased services	60,929	50,159
Energy and utilities	6,417	5,259
Depreciation	14,023	18,097
Grants in lieu of municipal taxes	9,864	9,068
Other	10,749	7,916
	150,322	133,144
Operating income	30,511	18,823
Other income (expense)		
Interest income	28,452	18,553
Interest expense	(2,204)	(20,564)
Gain (loss) on disposal of fixed assets	3,089	(2)
Gain on disposal of investments	–	550
	29,337	(1,463)
Net income	59,848	17,360
Deficit at beginning of the year	(302,893)	(320,253)
Deficit at end of the year	$(243,045)	$(302,893)

Statement of contributed capital
for the year ended December 31, 1981 ($000's)

Balance at beginning of the year	$ 349,361	$ 350,872
Adjustment to contributed capital	–	(1,511)
Balance at end of the year	$ 349,361	$ 349,361

Balance sheet

as at December 31, 1981 ($000's)

	1981	1980
Assets		
Current		
Cash	$ 1,749	$ 3,932
Investments (market value: 1981 – $120,286 1980 – $167,150)	120,160	173,513
Accounts receivable	30,134	25,306
Materials and supplies	2,133	2,203
	154,176	204,954
Long-term		
Investments (market value: $66,142)	81,778	–
Amounts receivable	6,848	7,155
Investment in Ridley Terminals Inc.	24	–
	88,650	7,155
Fixed		
Land and harbour facilities	752,415	715,264
Less: accumulated depreciation	312,986	307,271
	439,429	407,993
	$ 682,255	$ 620,102
Liabilities		
Current		
Accounts payable and accrued liabilities	$ 34,948	$ 29,478
Grants in lieu of municipal taxes	11,997	14,355
	46,945	43,833
Long-term		
Accrued employee benefits	8,451	7,863
Financing provided by province	20,793	21,599
Loans from Canada	499,750	500,339
	528,994	529,801
	575,939	573,634
Equity of Canada		
Contributed capital	349,361	349,361
Deficit	(243,045)	(302,893)
	106,316	46,468
	$ 682,255	$ 620,102

Port of Nanaimo

(Extracts from Nanaimo Harbour Commission Annual Report 1981)

Chairman's report (extract)

For the Port of Nanaimo 1981 was a year of outstanding events and developments – a year of achievement. It was a year of which we can be proud for what was accomplished.

In spite of the downturn in shipping as a result of the general economic depression starting about mid-year, the port is in a healthy financial position, a fact which we feel is due to the efficient operation of the port.

Great progress was made in the continuing program of port development. The completion of "D" berth at Duke Point, culminating years of planning and preparation, must be considered a milestone in the Port of Nanaimo's history. The new berth which is Phase 1 of the construction program, accommodates vessels of 210 m (700 ft) length and 13.5 m (45 ft) draft. Fifteen of the 70 acre black-topped storage and assembly area was completed at the same time as a portable office was established.

The new berth went into operation last December. The first load of lumber to arrive at the storage area was a special occasion. Herb Doman, company president, drove the truck from the nearby Doman sawmill, which had begun operating earlier in the year, breaking a red ribbon as a crowd of spectators watched.

The 350 acre Duke Point industrial area will eventually be served by two such berths. Phase 2 will go ahead as soon as required.

First Ship

The first ship to load at the new berth was the M/V Skaugran, an ultra modern Ro-Ro vessel which arrived about mid-December. Harbour Commissioners, staff members and shipping company representatives were on hand

for this special occasion. To mark the dramatic event we presented Skaugran's Master, Captain Mons Eggesbo with a bronze plaque from Nanaimo Harbour Commission. It was a red-letter day for our port. For the Commissioners and staff it was the realization of a long-held dream.

While the start-up of operations at "D" berth was of great importance to us, berths "A", "B" and "C" had not been idle. Export shipments to world markets had been continuing at a regular pace at least until the latter part of the year when the depressed condition of the market began to be felt.

As a result shipping figures for 1981 are down from the high levels reached in the boom year of 1980. Lumber shipments show a decline as do newsprint but pulp had only a slight decrease.

Vessel arrivals dropped from 171 in 1980 to 153 in 1981 but total net registered tonnage shows only a slight decline from 1,983,057 to 1,834,831. Log shipments went from 16,559 to 4,025.

Japan was our major customer for lumber, also for the combined total of logs, lumber and pulp. U.S. Atlantic ports were in second place for lumber shipments. The U.K. Continent came third in lumber shipments and second in pulp. As usual cargo destinations indicate Nanaimo shipments go all over the world.

New Patrol Boat

One of the highlights of the year was getting our new patrol vessel. NH Patrol II was commissioned November 7th, 1981 at the Commercial Inlet Boat Basin. The new craft takes the place of the old patrol vessel which had been in service since the Commission started 20 years ago.

NH Patrol II is a sturdy, powerfull, multipurpose vessel capable of meeting most emergency situations as well as its regular patrol duties and passenger carrying requirements. She has an L.O.A. of 42 feet and twin diesels producing 350 hp.

Cost of the vessel including installation of electronics, safety and rescue equipment came to $329,841. The NH Patrol I has been sold.

Investment and Maintenance

Construction of "D" berth at Duke Point at a cost of $7,130,863 has been a major addition to the Commission's fixed assets. Another $56,315 was spent on a building to serve the new berth and storage area.

The new office building at Assembly Wharf near berth "A" cost $193,549 plus $9,885 for equipment.

Maintenance of wharves, piers and floats for the year cost $580,645. Operating expenses were $1,665,738. Administration costs totalled $794,172. This figure includes $119,125 for the harbour generally, $79,417 for property management, $476,505 for wharves and floats, and $119,125 for sheds and terminals.

Don J. Rawlins,
Chairman

Balance sheet

as at December 31, 1981

	1981	1980
Assets		
Current		
Cash	$ 248,509	$ 2,316,504
Short term investments	3,600,000	–
Accounts Receivable	508,837	498,352
Inventories	10,043	9,412
Unbilled Handling Charges	92,169	116,349
Prepaid expenses	8,702	2,275
	4,468,260	2,942,892
Fixed		
Fixed assets	$ 16,699,886	$ 8,963,709
Less: Accumulated depreciation	4,119,568	3,635,595
	12,580,318	5,328,114
Deferred charges		
Harbour development costs	$ –	$ 485,455
Deferred pension costs	11,400	–
	11,400	485,455
	$ 17,059,978	$ 8,756,461
Liabilities		
Current		
Accounts payable	$ 1,235,445	$ 427,421
Equity		
Government of Canada Contribution	$ 9,622,049	$ 3,322,049
Nanaimo Harbour Commission		
Balance beginning of year	$ 5,127,184	$ 3,751,041
Net income for the year	1,180,618	1,376,143
	6,307,802	5,127,184
Capital loss on disposal of fixed assets	$ 105,318	$ 120,193
Total equity	$ 15,824,533	$ 8,329,040
	$ 17,059,978	$ 8,756,461

Statement of income

for the year ended December 31, 1981

	1981	1980
Revenues	$ 4,218,051	$ 4,235,280
Expenses		
Operating	$ 1,783,386	$ 1,573,730
Maintenance	599,623	607,728
	$ 2,383,009	$ 2,181,458
Indirect Administration	794,172	492,659
	$ 3,177,181	$ 2,674,117
Income before depreciation and capital interest	$ 1,040,870	$ 1,561,163
Depreciation	$ 490,169	$ 417,247
Capital Interest	–	586
	490,169	417,833
Operating income	$ 550,701	$ 1,143,330
Interest earned on investments	629,917	232,813
Net income for the year	$ 1,180,618	$ 1,376,143

Port of Gothenburg

(Extracts from Port of Gothenburg Annual Report Summary 1981)

Summary

National Economy

According to preliminary estimations, the Swedish GNP decreased by 0.8% between 1980 and 1981. Between the years 1979 and 1980, there was an increased of 1.6%.

The following table illustrates Sweden's sea-borne international trade in 1981 as compared to 1980.

	1981 mill tons	1980 mill tons	Change in %
Exports excl iron ore	30.4	31.7	– 4%
Exports excl iron ore & excl mineral oil	25.9	26.1	– 1%
Imports, total	48.9	54.9	–11%
Imports of mineral oil	24.5	31.2	–21%
Other import cargo	24.4	23.7	+ 3%

The total net register tonnage of foreign trading vessels decreased from 1980 to 1981 by 9%.

The number of passengers arriving by vessels to Swedish ports decreased from 1980 to 1981 by 1%.

Port trade

The following table illustrates traffic to and from the Port of Gothenburg in 1981 as compared with 1980:

	1981 mill tons	1980 mill tons	Change in %
Throughput of Cargo			
Exports (incl transhipment)			
Mineral oil	1.26	1.27	– 1%
Other export cargo	4.10	3.62	+13%
Total exports	5.36	4.89	+10%
Imports (incl transhipment)			
Mineral oil	8.53	9.41	– 9%
Other import cargo	3.33	3.11	+ 7%
Total imports	11.86	12.52	– 5%
Domestic trade			
Mineral oil	4.19	4.87	–14%
Other domestic cargo	0.07	0.05	+40%
Total domestic traffic	4.26	4.92	–13%
Grand total	21.48	22.33	– 4%
Shipping	mill NRT	mill NRT	
Vessels in foreign trade	57.6	58.5	– 2%
Vessels in domestic trade	6.4	7.1	–10%
Total	64.0	65.6	– 2%
Ships' Passengers	mill	mill	
Number	3.4	3.5	– 3%

Unit Load Traffic

	Number	Number	
Containers and flats (20 ft TEU's)	262,000	235,000	+11%
Roll on/Roll off vehicles	219,000	235,000	– 7%
Total (excl palletised cargo and packaged forest products)	481,000	470,000	+ 2%

The total unitised cargo trade represented 81% of Gothenburg's general cargo trade in foreign traffic (the same percentage refers to 1980).

Gothenburg's share of total Swedish sea-borne exports (excluding oil and iron ore) increased from 13.9% in 1980 to 15.8% in 1981. A comparison with respect to general cargo only, shows that exports via Gothenburg represented 16.1% of Sweden's total sea-borne general cargo exports in 1981 (in 1980 14.4%).

Gothenburg's share of total Swedish sea-borne imports (excluding oil) increased from 13.1% in 1980 to 13.7% in 1981. As for general cargo, Gothenburg's percentage of Sweden's total sea-borne general cargo imports was 18.0% in 1981 as against 18.8% in 1980.

Out of total Swedish sea-borne oil export, Gothenburg's share increased from 22% in 1980 to 28% in 1981.

Out of Sweden's total sea-borne oil import, import via Gothenburg represented 35% in 1981, as against 30% in 1980.

Improved facilities

The Port Authority's expenditure on fixed capital in 1981 amounted to a total of 62.2 mill SEK.

Works carried out resulted, i.a., in the following improvements/additional facilities:

Skandia Harbour

In the Elfsborg terminal berth No. 702 has now been taken into operation. The berth has a length of some 290 m. Since autumn 1981, this berth is in use for transocean ro/ro-liner services. The completion of this berth has resulted in a concentration of all transocean ro/ro-services to the Elfsborg terminal. Marshalling areas within the terminal have been extended to serve the increasing traffic.

Preparatory work has been carried out, pending the delivery of container crane No. 5 in the Skandia terminal. This crane will be delivered in spring, 1982. A project work has started with a view to improving reception and identification of export cargo in the Skandia terminal.

Inner Harbours

In the Free Harbour, railroad and crane tracks have been rebuilt and extended, and the marshalling areas have also been improved.

Traffic Guidance System

As was reported in last year's annual report a brand new traffic guidance system will be implemented in 1982. The system will comprise a Traffic Control Centre near the Elfsborg Bridge to follow vessels traffic within the Port area by way of radar and VHF-communication.

Forecast

The Swedish National Budget anticipates for the year 1982 a slightly upward trend in business within the OECD area. The forecast for Sweden, e.g., is an increase of 1%.

An increase in world trade of a few percent is also anticipated. Sweden's volume of export cargo is supposed to increase by about 7%, whereas volume of imports is supposed to increase by about 3.5% as against 1981.

As for Port of Gothenburg, we anticipate some increase of dry cargo throughput also during 1982. The prognosis for the following three years indicates an annual increase in dry cargo throughput of about 3.3%.

The total oil throughput via Gothenburg will in 1982 probably be 5 to 10% higher than in 1981. However, for the period 1980–1985 oil throughput is supposed to decrease by at least 3% per year.

Profit and loss account

	1981 kkr 000 SEK	1980 kkr 000 SEK
Operating Revenue	124,465	117,492
Works on contract	44,838	24,415
	169,303	141,907
Operating and General Expenditure	–107,092	–89,329
Operating profit before Depreciation and Interest	62,211	52,578
Depreciation	–17,961	–17,347
Interest on loans	–37,730	–29,901
Net Profit	6,520	5,330

Balance sheet

as at 31 December 1981

	1981 kkr 000 SEK	1980 kkr 000 SEK
Assets		
Current Assets		
City of Gothenburg	78,401	110,083
Cash Balance	8	20
Postal Cheque Acct Balance	641	–
Bank Balance	5,770	4,534
Accrued Income	35,930	35,824
Accounts Receivable	17,565	12,594
Stores and Materials on Hand	355	441
Total	138,670	163,496
Fixed Assets		
Long Term Receivables		
City of Gothenburg (Net Profits, Amounts Accrued)	543	543
Gothenburg Free Port Ltd	1,855	1,855
Facilities		
Land, Buildings, & c.	583,036	555,480
Cranes, Vessels, Dredgers, & c.	49,384	47,234
Total	634,818	605,112
Grand Total	773,488	768,608

Liabilities, Capital Reserves and Net Profit

	1981 kkr 000 SEK	1980 kkr 000 SEK
Current Liabilities		
Accrued Expenses	43,286	41,351
Creditors	8,636	34,510
Reserve for Depreciation of Stores and Materials on Hand	277	278
Total	52,199	76,139
Capital Liabilities		
Share of Municipal Bond Loans	418,594	395,640
Capital Reserves, & c.		
Reserves tied up in Fixed Assets	213,826	207,074
Fixed Capital Expenditure Fund	88,326	89,212
Budget Equalization Fund	543	543
Total	302,695	296,829
Grand Total	773,488	768,608

Port of Tauranga

(Extracts from Bay of Plenty Harbour Board, Port of Tauranga Annual Report 1980/1981)

Chairman's report (extract)

Trade

After four years of strong expansion, the growth in world trade volumes began to slow considerably in the latter half of 1980 as a result of the weak economic performance by major industrial countries; specifically, reduced oil movements and the slower growth in world trade of agricultural products, forest products and manufactured goods were contributing factors. From the Port of Tauranga's point of view, export trade is almost entirely influenced by the economic performance of Australia and the Pacific Basin Countries while the Port's import trade volumes are influenced by domestic developments within the agricultural and forestry industries.

In line with the international decline in trade, total trade serviced by the Port of Tauranga declined 20% to 3 million tonnes for the year ending September 1981. Of this, export trade declined 24%, while import trade declined 13%. Exports accounted for 58% of our total trade, and imports increased its share to 42% – this trade split has been 60:40 in favour of exports in recent years.

The downturn in forest products exports is attributable to depressed demand for most products in the major consuming nations of the world and the diversion by other suppliers of significant quantities of forest products to

New Zealand's traditional markets.

The decline in the volume of dairy products serviced by the Port is of particular concern to the Board, especially as facilities and services at the Port of Tauranga for the export of dairy products are second to none in New Zealand. Moreover, total port charges and stevedoring costs combined are amongst the most competitive of all New Zealand ports. We recognise that some of the markets traditionally serviced by the Port of Tauranga show a preference for containerised dairy products. However, in view of the Port's ability to handle cargo presented in any manner, the Board believes that the Dairy Industry's interests will be best served if the diversion of products originating within the Port district is kept to the absolute minimum.

The decline in import volumes is attributable to the recession in the domestic economy and a reduction in commercial stock levels; specifically imports of fertiliser bases reflected a lower level of useage within the agricultural industry and similarily imports of petroleum were in line with a lower national consumption and the substitution of fuel oil for other energy forms.

The small reduction in the number of vessels handled during the year and the availability of the new cement tanker berth have meant that the Board has been able to provide a significantly greater flexibility on the main wharf, which in turn has meant a reduced need to shift ships during loading or discharging, with a consequent increase in Port efficiency.

In particular, the commissioning of the specialised cement/tanker berth together with the new berthage policy and an increase in the Waterfront Bureau register strength have resulted in considerable increases to the operational efficiency in the Port. Shipping delays were reduced by 97% – only 8.7 ship days were lost during the year ended September 1981, and turnround time in general by vessels using the Port was significantly reduced. In 1981 the average days in port were 4.0 compared with 5.4 days for 1980.

Port Operations and Facilities

The 1981 operating year was reasonably harmonious as far as industrial relations were concerned. The only significant disruption to Port operations was a dispute with the New Zealand Merchant Service Guild concerning local conditions of service and employment for our Pilots. Overall, and in view of the downturn in trade, my Board is most greateful for the assistance given by Port Unions in enabling the Board to do more with less.

During the year the Board renewed and approved a number of leases involving Board land and facilities for various Port related activities; confirmed its intention to set aside an area designated for fishing industry purposes in its future planning for the Sulphur Point reclamation project; approved the purchase and installation of fire fighting equipment for the cement-tanker berth; the purchase of oil spill control equipment for installation on one of the Board's tugs and on the Board's workboat; the purchase of a grain silo installation currently situated on the main wharf and approved a wharf maintenance programme commensurate with the reduced level of trade and available finances.

To meet the changing needs of the Port and its users the Board amended its By-Laws pertaining to traffic and security within the Port Area and resolved to review these provisions from time to time.

The Board awarded its Perpetual Challenge Trophies for the 1980-81 season to the Sunny Park Co-operative Dairy Company Limited for the highest average grade of export butter and to the Bruntwood Co-operative Dairy Company Limited for the highest average grade of export cheese.

Prospects

Economic conditions in most parts of the world have been far from favourable during the past few years and only a moderate recovery is forecast, with the result that for 1982-83 world trade is expected to grow by between 3 and 4% on 1981 (compared to the 7 to 9% growth experienced in the early 1970's). As a general comment, and from New Zealand's point of view, the economic circumstances of New Zealand's main trading partners, (Australia, Japan, U.S.A. and the United Kingdom) will largely determine the growth in trade volumes enjoyed in the immediate years ahead. Economic development within the countries of the Pacific Basin at large will create international trade and present opportunities for New Zealand. The Port of Tauranga is well placed to service trade within this entire region.

Outside the direct influence of a modest recovery in the world economy and international trade, future trading activity linked to the Port of Tauranga may well be influenced by the final nature of closer economic relations (CER) with Australia as well as a number of domestic developments. Whilst the full ramifications of CER for the Port of Tauranga cannot be foreseen, it will inevitably bring with it increased trading opportunities for the Port and its hinterland. From a domestic point of view, changes within the New Zealand energy supply scene and the restricted availability of logs from the Central North Island area throughout the 1980's will together mean a reduced level of trade from these two industry sectors. However, an increase in forest product manufacturing capacity within the Port's hinterland will offset this reduction in trade to a limited degree.

Although the volume of total trade serviced by the Port of Tauranga during the next few years is expected to be reasonably static, there will nevertheless be opportunities for new and increased export trades. Kiwifruit export volumes are expected to increase more than three-fold by 1985 and at these levels the cheapest route to market will likely be via the Port of Tauranga. New Zealand meat export trade is currently the subject of a thorough study; as a result of possible changes within the industry and the conduct of its export trade, opportunities to assist meat exporters are likely to soon arise.

Port operations are becoming an increasingly important part of the shippers' and shipowners' world and in this we recognize that the skill, integrity and record of port operators are an important part of the international trading scene. We believe that for the years ahead the Port of Tauranga is well prepared and extremely well placed to assit the importer and the exporter to carry out his business in the most expeditious and economic manner.

J.W. Syme
Chairman

Results in brief

year ending September

	1981	1980
Cargo tonnage in	1,275,413	1,469,228
Cargo tonnage out	1,758,055	2,313,385

Total cargo tonnage throughput	3,033,468	3,782,613
No. of vessels (arrivals):		
oversea	336	415
coastal	127	109
total	493	524
Total harbour shifts	100	330
Net Registered Tonnage:		
overseas arrivals	2,161,036	2,576,733
coastal arrivals	525,424	476,575
total arrivals	2,686,460	3,063,308

Balance sheet

as at 30 September 1981

	1981	1980
Current Assets	NZ$	NZ$
Cash and Deposits	2,385,143	2,152,329
Debtors	881,801	1,195,070
Prepayments	16,700	44,400
Stores and Materials	717,987	686,306
	4,001,631	4,078,105
Less Current Liabilities		
Prepayment	16,000	
Creditors	211,711	333,182
Net Loans Repayable within year	594,267	549,660
	821,978	
Working Capital	3,179,653	3,195,263
Investments		
National Provident Fund	1,033,123	937,073
Fixed Assets		
Wharves	13,372,933	
Land Endowments & Reclamations	9,989,056	
Buildings	3,860,919	
Harbour Improvements	10,271,003	
Floating Plant & Equipment	2,593,474	
Shore Plant & Equipment	4,289,886	
Vehicles	376,123	
Capitalised Interest	504,936	
Waterfront Industry Commission Building	128,700	
Caltex Oil Pipelines	22,716	
	45,409,746	39,604,574
	49,622,522	43,736,910
Less Term Liabilities		
Net Public Debt	18,279,109	19,240,335
Deferred Payment – Land	170,446	85,598
	31,172,967	24,410,977
Total Net Assets		
Represented by		
Public Equity	24,789,922	23,473,905
Revenue Reserves	1,033,123	937,072
Asset Revaluation Reserve	5,349,922	
	31,172,967	24,410,977

Revenue and Appropriation Account

for year ended 30 September 1981

Port Operations	1981	1980
Revenue	NZ$	NZ$
Cargo Charges	6,169,103	6,501,703
Ships Charges	2,542,796	2,619,369
Plant Hire	533,670	488,164
Sundry Revenue	91,853	97,823
	9,337,422	9,667,059
Less Expenses		
Operating Expenditure	5,867,069	5,061,986
Depreciation	1,230,834	1,155,781
Interest	1,808,813	1,596,671
Others	37,405	23,289
	8,934,121	7,837,727
Net Revenue from Port Operation	403,301	1,829,332
Other Income		
Interest on Investments	512,923	471,647
Income from Rentals	264,947	308,219
	777,870	779,866
Exceptional Items		
Contributions – Marina Berth-holders	247,750	
Gain on Disposal Fixed Assets	11,036	46,931
Revenue before Appropriation to Reserves	1,439,957	2,656,129
Revenue Appropriated to		
General Reserves	60,296	52,796
Plant Reserves	35,754	31,307
Balance	1,343,907	2,572,026
	1,439,957	2,656,129

Port of Auckland

(Extracts from Year Book 1981, Auckland Harbour Board)

General Manager's review (extract)

The year ended 30 September 1981 saw a fall in the tonnage of cargo handled by the Auckland Harbour board—the third successive occasion on which this has occurred in the year of a General Election, in contrast with increases or recoveries in trade in every non-election year since 1968.

A dull economic climate and the effects of several major industrial disputes in the first five months of 1980-81 saw port throughputs running more than 12 per cent below those of the corresponding period in 1979-80.

However, the stimulus given to the economy by a large Government budget deficit, increased supplies of money and credit, together with a relatively quiet industrial scene, produced an upturn in port activity during the second half of the year, lifting trade to 5.798 million tonnes in the 1980-81 year—121,500 manifest tonnes, or approximately 2 per cent less than in the previous year.

The year saw a continuation in the major trade trends of the past decade—strong export growth, rising general cargo imports and falling bulk imports.

These trends are clearly illustrated by comparing trade in 1980-81 with that in 1970-71, the year which saw the commencement of container services. In the subsequent 10 years, general cargo exports from Auckland have risen by more than 605,000 tonnes, or 61.4 per cent, to 1.59 million tonnes. General cargo imports have expanded by

30.4 per cent or 467,000 tonnes to approximately 2 million tonnes.

The same period has seen a fall of more than 470,000 tonnes or almost 20 per cent in bulk cargoes to 1.987 million tonnes.

General cargoes have risen from 51 per cent of Auckland's trade in 1971 to 65 per cent in 1981 including container terminal throughputs accounting for 1.218 million tonnes (22 per cent of all trade) and roll-on, roll-off cargo of 884,000 tonnes (16 per cent of all trade).

The trend toward containerisation has enabled the Port of Auckland to handle larger tonnages of meat, wool and dairy produce stemming from increased livestock numbers on farms in the King Country, Bay of Plenty, Waikato and Northland, and the rapidly growing tonnages of fruit and vegetables exported by a booming horticultural sector.

Roll-on, roll-off facilities and services are catering for steady growth in manufactured exports such as electrical appliances, carpets, paper and wood products. With the assistance of currency devaluations and tax incentives, shipments of these goods are being sold in increasing quantities in Australia and in expanding markets like Papua-New Guinea and South-east Asia.

Shipping services to New Zealand's major trading partners in Europe, North America and Japan are now mostly containerised, although imports of motor vehicle parts and steel from Japan continue to provide a major share of conventional cargo trade.

The rising share taken by general cargoes has several important implications for the Board's finances. It makes trade more vulnerable to the fluctuations in the world economy which determine the market levels for most of New Zealand's exports and the ability of the country to finance imports—especially general cargo items such as expensive machinery and consumer products. It also concentrates on the area of port activity which bears high labour costs because of the need for greater manning levels and stand-by capacity.

Imports which have declined, such as fertiliser bases, petroleum products, cement, sand and gypsum, required very little labour input and made significant contributions to the Board's revenue without needing reserves of manpower to handle upturns in frequency and volume of discharges.

Recent investments made in port facilities, while essential to service the increasing volume and range of general cargo emanating from the northern half of the North Island, are providing a challenge to the Board's management in maintaining efficient services to shipping companies, importers and exporters within the constraints posed by economic fluctuations, financial considerations and environmental pressures.

An indication of such constraints is given by the fact that the Board's major item of expenditure, wages and salaries, rose during the year under review by $4.859 million to $37.181 million, accounting for nearly 70 per cent of the Board's operating revenue.

The coming year offers prospects for a slight recovery in trade as the carry-over of the election year economic stimulation is reflected in restocking by manufacturers and retailers.

As the principal port operator in a small, isolated country heavily dependent on maritime traffic and the world economy, the Auckland Harbour Board is increasingly conscious of the need to adapt and develop as national and international trends become apparent.

R.T. Lorimer
General Manager

Statistics summary 1980-1981

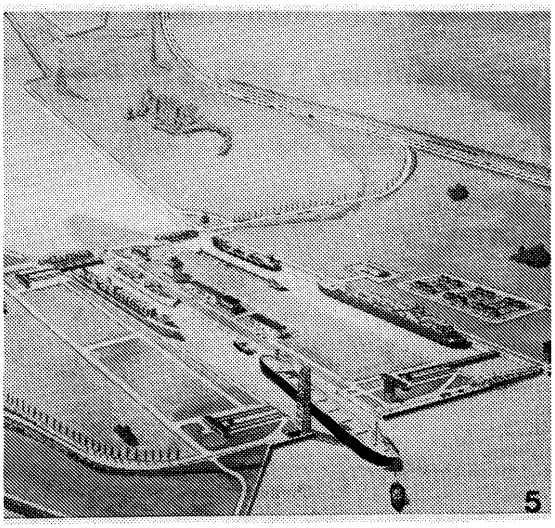
1 October 1980 to 30 September 1981

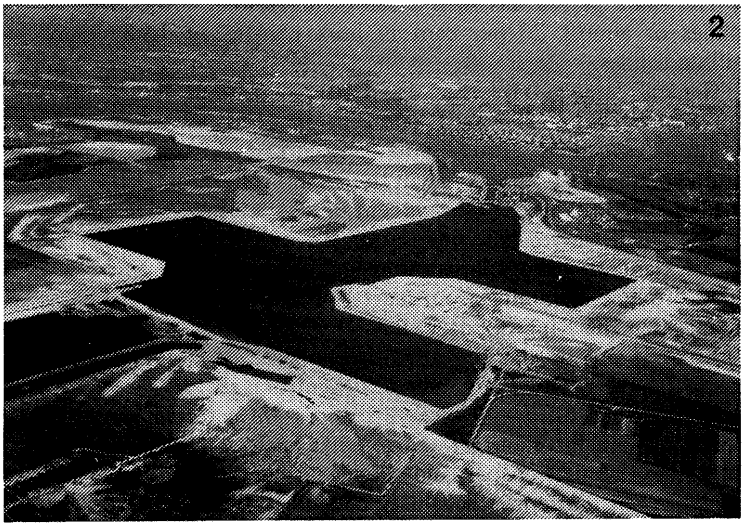
Operational

	1980-81	1979-80
Total ships (excluding naval, including Onehunga)	1,875	1,951
Number of container ship	206	222
Total cargo handled at Ports of Auckland and Onehunga	5.798 million tonnes	5.92 million tonnes
Export cargo	1.724 million tonnes	1.697 million tonnes
Import cargo	4.074 million tonnes	4.228 million tonnes
Container exchange (less movements on board ship)	86,986	87,688
Container tonnage	1.218 million tonnes	1.219 million tonnes
Roll-on roll-off tonnage	0.884 million tonnes	0.79 million tonnes
Conventional break-bulk including Onehunga	1.709 million tonnes	1.592 million tonnes
Bulk	1.987 million tonnes	2.184 million tonnes
Passenger ships	25	46
Passengers arriving and departing	6,500	10,522
Passengers in transit	21,112	31,854

Financial

Port Operations		
Revenue	$	$
Cargo charges and Cargo handling	13,205,098	12,043,538
Wharf Services and Towage	6,814,176	6,198,686
Container Services	30,649,250	27,242,077
Sundry Revenue	1,407,241	1,895,517
	52,075,765	47,379,818
Expenses		
Wages and salaries	37,181,343	32,321,926
Maintenance and Operating	8,564,717	7,372,102
Depreciation	3,200,235	3,023,693
Interest	4,925,972	4,819,946
	53,872,267	47,537,667
Port Working Account Surplus/ (Deficit)	(1,796,502)	(157,849)
Property		
Net Income	3,639,800	3,016,711
Financing		
Loans raised	2,613,620	2,713,030
Loans repaid	2,711,948	3,085,812
Sinking Fund Investments	1,992,078	1,791,725
Exchange loan risk reserve investment	3,065,812	2,644,793
How We Stand		
Total Assets	182,187,955	171,877,083
Total Liabilities	44,993,354	53,731,914
This leaves the current public equity in the Port of Auckland at	137,194,601	118,145,169





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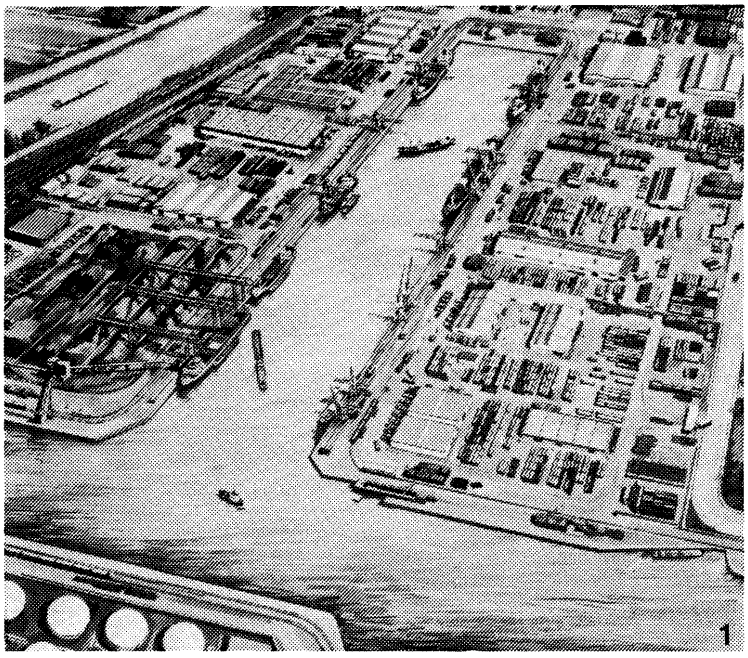
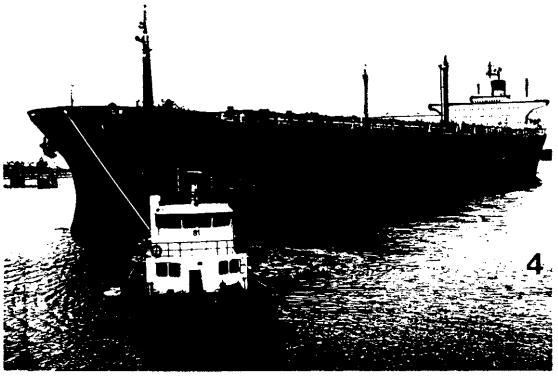
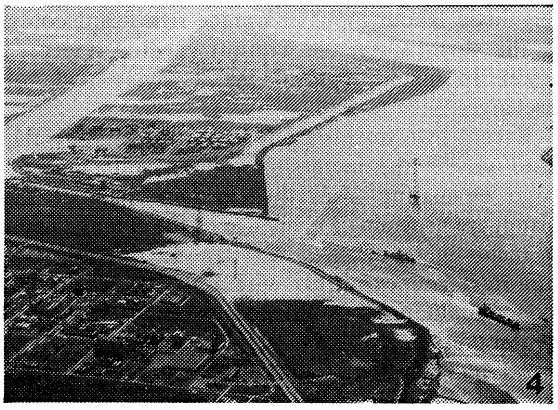
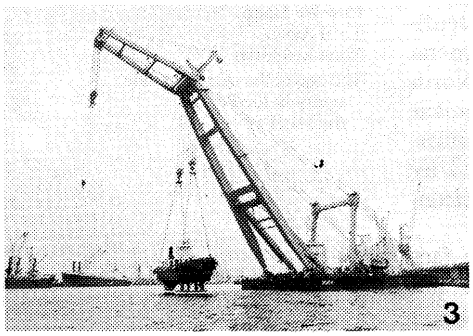








where growth is not just a planner's dream.

A few examples:

1. New Delwaide dock, in operation
2. New port on the left Scheldt bank, in operation
3. Self-propulsed derrick for heavy lifts
4. Improved navigability on the Scheldt seaway (48 ft. programme)
5. New twin lock at northern port entrance, under construction

A world port must have what it takes to guarantee high quality service to its clients. Dynamic approach to new traffics and continuous modernizing for growth are essential.

Inquiries: General Management, Town Hall, B-2000 Antwerp – Phone 31/31.16.90 – Telex 31.807

International maritime information: World port news:

UNCTAD seminar for port management instructors

The first of a series of seminars for port management instructors was conducted in Cardiff (United Kingdom) from 2 to 29 September 1982 by the United Nations Conference on Trade and Development (UNCTAD) in collaboration with the University of Wales. These seminars were the culmination of a project financed by the Swedish International Development Authority (SIDA) to develop validated training materials for a course on the Management of General Cargo Operations and to train local instructors to deliver this course in their own countries.

The course "The Management of General Cargo Operations" was designed for traffic officers, quay and shed superintendents, etc. from both the public and the private sector. Its objective is to train such staff to plan and organize the discharging and loading of vessels and to control the transfer and storage of cargo within the port, making the most efficient use of available resources.

Code of good management practice in safe ship operation : ICS and ISF

Introduction and Summary

Merchant Shipping is a specialised and technical business. Its complexity has been increased during the last ten years by the extensive new conventions developed by the International Maritime Organisation (IMO) and the International Labour Organisation (ILO), designed to improve safety and social conditions. But regulation–including the recent emergence of port state control–can only go part of the way to achieving the objective of safe and pollution-free shipping. In the end–while the Master is clearly responsible for the direct operation of the ship–the overall responsibility lies with the shipping company.

The purpose of this Code is to provide a broad framework of good practice against which management in companies operating ships may gauge their own organisation and procedures. Its contents are drawn from the best management practices of a number of different companies represented in the International Chamber of Shipping (ICS) and the International Shipping Federation (ISF). It is intended solely for voluntary use, either as a check-list or as a framework for reviewing company methods. Parts of the Code may not, of course, be appropriate for a particular company.

SAFETY and EFFICIENCY are integral to good management. They can only be the result of structured, painstaking policy and a combination of the right skills, knowledge and experience. The direct involvement of decision-taking management in these matters is vital. The attitude of an Owner and/or senior management is reflected in company policy and thus directly in the work of all the company employees. THE INITIATIVE MUST THEREFORE COME FROM THE TOP.

Adherence to the recommendation in this Code also makes sound commercial sense. By meeting at least the basic minimum standards a company will ensure that its ships are available for trading to the maximum possible extent. Time lost–through accidents, avoidable damage, correcting deficiencies, detention, or crew unrest–means more expense and less business.

The major recommendations are that:

- While the Master and the crew have direct responsibility for the technical and safety aspects of ship operation, every company operating ships should establish a department or at least designate a person ashore, responsible for those aspects of the operation from the shore standpoint. The person(s) involved should have knowledge and experience of the technical aspects of the ship (e.g. structure, equipment, documentation, etc.) and of the relevant national and international regulations. The existence of such a department or person does not, however, relieve senior management of responsibility for safe and efficient operation.
- Safety and operational practice should be a regular item for discussion at management meetings at all levels. Policy on these issues should be clearly defined and made known to employees.
- Management should ensure that shore-based personnel are aware of–and provide for–the needs of the Master and shipboard personnel, in regard to the safe and clean operation of the ship.
- Management should ensure that there is a sufficient number of crew on board to operate the ship and any specialised equipment carried. The crew should be medically fit, properly trained and qualified to perform the tasks required of them.
- There should be regular and effective two-way communication (1) between shore-based and shipboard staff and (2) between management (including senior management) and employees ashore and at sea. This should cover company policy on safety and operating practice.
- Proper arrangements should be established for use in the event of an emergency involving the ship. These should seek to ensure an effective and level-headed response to the incident both by the crew on board and by the shore-based staff.
- Management should review its overall approach to the matters covered by this Code on a regular basis.

2nd African Port Symposium: Port Management Association of West and Central Africa

Duration and date 3 days: November 24th to 26th, 1982

Place International Conference Center Livreville (Gabon)

Languages French-English (simultaneous translation)

Documents All papers lectured during the symposium will be provided to the attendees at the opening of the symposium

Patronages The ministerial conference of West and Central African states for Maritime Transport
The President of the Republic of Gabon

Hon. Presidency M. MEBIANE Prime Minister, Chief of Government, Minister of Merchant Marine of the Republic of Gabon

Collaboration Ecole Nationale des Ponts et Chaussees (France)

Programme

Chairman:
Mr. Bastard
Ingénieur Général des Ponts et Chaussées
Past President of the International Association of Ports and Harbors

Session chairmen:
Session 1: Dredging
Mr. Ngann Yonn
Directeur Général de l'Office National des Ports du Cameroun

Session 2: Containerization
Mr. Moulod
Directeur Général du Port d'Abidjan

Session 3: Security of goods
Mr. Tukur
General Manager of the Nigeria Ports Authority
Honorary President of the Port Management Association of West and Central Africa

Exhibition A technical exhibition will take place in rooms next to the Conference room

Registration Please use the enclosed form to register and send it back urgently to:
AGPAOC
c/o OPRAG
B.P. 1051
Libreville-GABON
Admission to the Symposium is free.

Reception and accommodation The persons intending to attend the Symposium should get in touch with the General Manager of the National Port Authority of Gabon who has the onus in organizing the participants stay in Libreville.
They should write to:
Direction Générale
OPRAG
BP 1051
Libreville-GABON

International essay competition

organized on the occasion of the 75th anniversary of the Rotterdam Port Industries Association

Subject

"Future of main seaports in the next 25 years."

Participation

The competition can be entered individually (monodisciplinarily) as well as together with co-students (multidisciplinarily).
Participation is expected from:
- Qualified employees of port authorities and organizations, harbour services and port industries (Port Authorities);
- Teaching staff, staff-members and students of universities;
- Institutions of transport, traffic and commerce.

Level

Scientifically based vision (University level).

Preamble

Main seaports, which are an important factor in the connection of the hinterland with the world, have to watch the developments of the freight flows and their position constantly.

There is a growing tendency to start transport and product flows as integrated systems. Every participant in transport systems–if he wants to survive–has to contribute to the mastery or control of those logistic systems. In turn, these developments may cause drastic changes in technological as well as economic functions in seaports.

Subject

Within the aforementioned scope subjects which have not previously been published can be focused on e.g.:
a. adaption of seaport functions in the next 25 years to world changes in product flows;
b. the consequences of industrialization in developing countries for harbour functions;
c. the effects of consolidation of goods on the conventional port activities, outside as well as inside the original port areas;
d. the autonomous and technical development, and developments induced by the three aforementioned points, in transport, transhipment and storage.

Of course the contributions need not expose all these aspects, but do have to contain a description of the economic consequences.

Jury

The jury has been empaneled as follows:
Prof. Dr. G.Chr. Meeuse
Department Transport Systems and Material Handling Engineering of Delft University of Technology.
Prof. Dr. A. van der Zwan
Marketing Analysis, Erasmus University Rotterdam

and member of the Scientific Council for Government Policy.
Prof. M.L. Manheim
Department of Civil Engineering, Massachusetts Institute of Technology, Cambridge (USA).

Prizes

1st prize $2,500.–
2nd prize $1,500.–
3rd-5th prize each $500.–
All participants submitting suitable contribution will receive a document in which their merits will be rated.

Language

English

Prize-awarding

1983

Entries

To arrive not later than January 15th 1983 with
SVZ-Rotterdam Port Industries Association
c/o Mrs. D.G. Kloss,
P.O. Box 6096,
3002 AB Rotterdam,
The Netherlands.

Improving warehousing and cargo protection: Port of Buenos Aires

By Messrs Andres Ascenzi and Hector Fidalgo

In the Port of Buenos Aires there are two single-story sheds now being used to warehouse general merchandise, while another three sheds of this type are under construction.

Given the dimensions of these sheds–30 m in width by 200 m in length, with ceilings at least 10 m high–storage space is evidently being wasted, since nothing can be stowed in stacks over 2.6 m high.

This limitation is due to the pressures produced when higher stacks are made, which damage the packages at the bottom of the stack, either immediately or in the course of time, due to the low-strength packing materials–usually cardboard–used in the boxes and cases. Weakness may cause the stack to collapse, creating risks for personnel working in the area and damaging other cargo. (See Photos 1, 2, & 3.)

If shelves are used, however, cargo can be stowed to heights of up to 6.80 m. This results in:

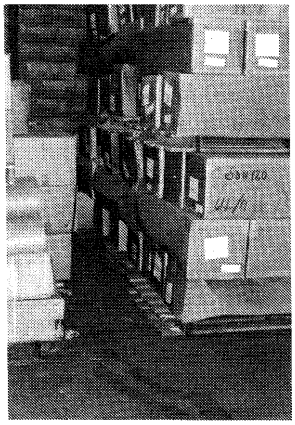
1) More efficient use of space, which can mean a (30%) higher income from warehousing in addition to better use of port plottage, which is always very scarce in older ports and very expensive when the city places limits on port expasion;

2) Better protection for cargo, making insurance rate reductions possible and improving the quality of service (See Photo 4); and

3) Better worker safety.

The investment pays for itself in 9 years with an internal rate of return of 15.8% per annum in a currency of constant value. (Photo 5 & 6) *(Orginal in Spanish)*


1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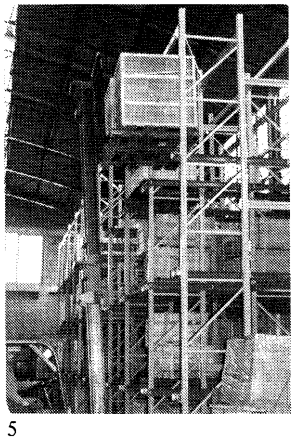
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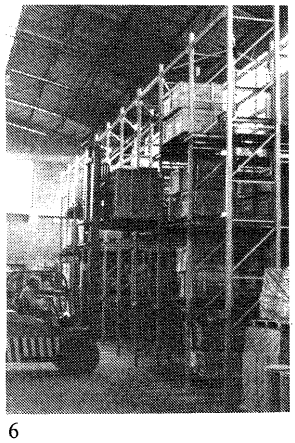
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Brazil's ports & waterways news

- According to document sent by Portobrás to the Government of the State of Pernambuco, the works that are being performed in the Port of Recife shall enable that terminal to cope with all cargo handling needs up to 1995. Portobrás' President Mr. Arno Oscar Markus has stated again that the works for the recuperation of the Port of Recife are not incompatible with the construction of the Industrial Port Complex of Suape, because the first one shall be only dedicated to general cargo

while the latter shall handle solid and liquid bulk cargo.

- The wheat terminal of the Port of Maceió, which is going to have a capacity of 10,000 tons and an area of 6,000 m^2, will be finished this year. The work is being performed with Brazilian and Canadian resources.
- The government announced that 18.6 billion dollars will be channeled this year to the design of improvement terminals for the handling of coal. After the inauguration of the terminals of Porto Alegre and Antonina there are still those of Sepetiba, Santos, Imbituba and Charqueadas to be completed.
- The basic project of the offshore port of Aracaju shall be ready until November and shall absorb resources of 17.4 million cruzeiros. The port shall be used mainly for the exportation of potassium chloride, urea, ammonia, cement and barilla.
- Portobrás ordered 96 port cranes, all of them with the technology of the German Takraf, 46 cranes to be built in Brazil by Bardella, Torque and Villares. The total order reached 150 million dollars.
- Portobrás' budget for this year has been reduced by Seplan to 41 billion cruzeiros for investments in the port sector. *(Portos e Navios)*

U.S. port traffic 1982 : AAPA

Just how is the U.S. port industry weathering the recession? That question is the subject of an ongoing review by AAPA. Overall, foreign tonnage handled at U.S. ports thus far this year appears to be substantially behind 1981. Much of that, however, is explained by the drastic drop in petroleum imports. The strengthening value of the U.S. dollar abroad has also impacted negatively on imports, particularly general cargo.

There is some suggestion that the oil import decline has bottomed out and that this traffic would pick up somewhat through the remainder of 1982 as the industry begins to rebuild depleted stocks. As for coal, some analysts are saying that exports this year may be only a little short of a million tons of the all time record of 110 million tons set in 1981.

The worst appears to be over in the North Atlantic region. Traffic there has picked up noticeably since January, despite the continuing poor state of oil import tonnage. Heavy coal exports out of Hampton Roads and Baltimore have contributed to the upswing. Container traffic is even or ahead of last year at most of the ports we talked to. The same is true of auto imports.

The South Atlantic ports as a group, have seen their traffic even out or begin to slide below last year's level. The same is generally true of the North and South Pacific port ranges. In the North Pacific, some ports have been particularly hard hit by the depressed log and timber trades and by slower than normal grain exports, at least through the first half of the year.

The biggest problems lie in the Gulf and Great Lakes regions. For the Gulf the crude petroleum drop off has been particularly severe. The slackening coal export market has hurt the Mississippi ports. At some ports in Texas, the fiscal crisis in Mexico is a prime concern. For the Lakes, the biggest blow has been a huge cutback in iron ore movements. Grain is moving out of the Lakes (and, of course, the Gulf), but not as much as the ports would like to see. For grain ports around the country, just how the year turns out depends greatly on what the Russians do. Another problem for the Lakes, hanging over them like the sword of Damocles, is the impact of the anti-steel cases now before the Department of Commerce and the International Trade Commission, particularly those involving the European Economic Community. On the bright side, Great Lakes coal traffic to Canada and overseas is surprisingly strong.

U.S. waterborne foreign commerce (January-April)

Some suggestion of how things stand now is comparison with last year is given by the following tabulation of Census Bureau data:

	U.S. Total		North Atlantic	
	1981	1982	1981	1982
Total	292,785,500	263,286,500	83,922,000	85,225,500
	South Atlantic		Gulf	
Total	22,168,000	20,792,000	135,404,000	115,543,500
	North Pacific		South Pacific	
Total	23,363,000	19,537,000	21,086,500	17,682,000
	Great Lakes			
Total	7,341,000	5,147,500		

Source: U.S. Department of Commerce, Bureau of the Census.

(AAPAADVISORY)

Project improves efficiency at bulk materials plant: Alabama State Docks

Major surgery has been performed at the Alabama State Docks Bulk Materials Handling Plant over the past several years and the patient is healthier, more robust than ever!

The Port of Mobile has long been noted for its efficient handling of import bulk cargo such as iron ore, coal and other commodities. Now that an expansion and modernization program costing a total of about $26 million is nearing completion, bulk operations at the State Docks facility are becoming more efficient than ever with high capacity import as well as export capability available to Port of Mobile customers.

The plant is located at the junction of Three Mile Creek and the Mobile River, marking the extreme northern end of the main Alabama State Docks complex.

Two large ocean-going bulk carriers now can be worked at the same time. Forty-foot-deep water is maintained all along the newly-constructed 1,540 feet of dock at the facility.

The plant has been designed for maximum versatility. Import commodities can be moved from the vessels by modern conveyor system directly to waiting rail cars or barges, or transported to storage. Cargo can be moved from storage to rail, barge or vessel for loading.

The conveyor system, barge loader, ship loader, field stacker and conveyor system have all been upgraded over the last several years to move material in a continuous flow at a rate of about 1,800 to 2,000 tons per hour.

A number of improvements costing about $15 million has been made since the visit of Hurricane Frederic in September, 1979, leaving bulk operations at the Alabama State Docks in a shambles.

Erection of the second unloading tower, rebuilding of

the conveyor system, and construction of the new 1,540-foot-long dock are among the major improvements since the hurricane.

Many of the improvements made over recent months are directed toward export operations. A new rail car dump is nearing completion at a cost of over $2 million. It will have a throughput capability of about 21 cars per hour. Other export projects include a reworked storage pad that will hold about 35,000 tons and a new storage-to-ship conveyor system.

As with import operations, export movement can be totally flexible, with cargo moving from rail to vessel, storage or barge; and from barge to vessel or storage for subsequent handling.

Now that the surgery is just about over, the patient is beginning to throw his weight around, and shippers using the Port of Mobile will enjoy more economical and efficient service than ever before.

Colalillo heads Duluth Port Authority

Albert P. Colalillo of Duluth has been named the president of the Seaway Port Authority of Duluth. Colalillo, a long-time advocate for maritime labor interests in the port, succeeds Commissioner Donald W. Ireland of Duluth.

Colalillo was first appointed to the Duluth Port Authority in 1976 by the St. Louis County Board. He was reappointed as one of two representatives of that body to the seven-member Port Authority in January of this year.

Seaport business increases: Massport

Massport's Executive Director, David W. Davis announces that the Authority's maritime business is on the rise. Figures for the recently ended fiscal year indicate an overall 5 percent increase in volume since June, 1981. Massport's marine terminals handled 695,522 tons of general cargo in FY '82, and early reports for this year show the upward trend continuing.

General cargo coming through the Port of Boston at Moran and Conley Terminals include all containerized and breakbulk commodities as well as lumber and automobiles.

Massport's Port Director, Martin C. Pilsch, Jr. points out that the FY '82 increase in general cargo tonnage is primarily the result of import gains. "Import tonnage increased by 16 percent. The Port benefitted from a dramatic increase in lumber shipments, the growth in the Mediterranean traffic, and an increase in foreign automobile business despite import restrictions."

Pilsch adds, however, that the 15 percent decline in export tonnage for FY '82 is related to economic conditions that have weakened market demand for United States' products and is also a problem shared with other North Atlantic ports.

Euro-Pacific agreement: Port of Oakland

A five-year use agreement between the Port of Oakland and Euro-Pacific, a consortium of three major European shipping lines, was approved on first reading of a Port Ordinance recently by the Oakland Board of Port Commissioners.

The agreement commits the lines—Compagnie Generale Maritime, of Paris, France; Hapag-Lloyd AG, Hamburg, Federal Republic of Germany; Intercontinental Transport (ICT) BV, of Rotterdam, The Netherlands—to use Port of Oakland Public Container Terminals as their published, regularly-scheduled, San Francisco Bay Area Port-of-Call in the Euro-Pacific all-water service between Europe and the Pacific Coast.

Euro-Pacific has provided such all-water service since 1971. It has provided container ship service at the 7th Street Public Container Terminal since November, 1974, on a full tariff basis. The consortium presently operates six containerships in regular service between Europe and Pacific Coast on a 10-day frequency, inbound and outbound.

"In view of the continuing competition within the Bay Area for marine terminals," said James J. O'Brien, deputy executive director of the Port of Oakland and head of the Port's Maritime Division, "it is clearly in Oakland's best interest to enter into a firm, long-term agreement with this established and highly regarded shipping service."

New cargo berths await voter approval: Port of Portland

The Port of Portland Commission recently agreed to move ahead on a $38 million general obligation bond measure for the improvement of the Port's Terminals 1 and 2. The bond measure will go before the Port District voters in November 1982.

The proposed reconstruction will provide the north end of Terminal 2 with two modern ship berths, a 100-ton crane and 18 acres of backup storage area. At Terminal 1, essential repairs will be made. New dock pilings, decks and shed roofs are contemplated.

The new facilities at Terminal 2 will be extremely versatile, serving a wide variety of existing and planned shipping technologies including traditional breakbulk, barge, roll-on/roll-off and containerized cargoes.

Presently, Terminals 1 and 2 serve the exporting markets for over 500 firms in the tri-county area. These facilities generate 1,000 direct jobs in an average year. They do not, however, generate enough capital to provide for these needed improvements; therefore, public support is necessary.

A broad range of products—virtually all ocean carried commodities produced in the tri-county area, from machinery to forest products—go across these docks.

The two terminals give the Port the flexibility to serve a variety of markets such as Australia, the Middle East, Africa, the Mediterranean, the Indian Subcontinent, South America and Hawaii. The Terminal 1 and 2 improvements are part of a larger 20-Year Marine Terminals Master Plan designed to move the Port of Portland into the 21st century with adequate facilities to serve the needs of its cargo and steamship customers.

By the Year 2000, it has been estimated there will be a threefold increase in the volume of cargo moving across Port of Portland docks. To handle this increase, the Port, with the assistance of a 30-member citizen's task force, determined that 18 new ship berths would be necessary within the next 20 years.

The price tag for the total facility package is roughly $270 million, most of which can be financed through private means.

Henry Tecklenburg, Jr. elected SCP's Chairman

Henry Tecklenburg, Jr. of Charleston was elected chairman of the South Carolina State Ports Authority board at their regular meeting recently in Charleston.

Tecklenburg succeeds Ralph M. Hendricks of Charleston as Chairman.

Tecklenburg is a widely-known oil executive who has held many high local and state offices. He is board chairman of Power Oil Co., president of Estec Petroleum Co., and chairman of Southern Oil Lubricants. Earlier, he was in the insurance business, served as Charleston County Auditor and was on the State Development Board.

SCP tonnage another record year

In fiscal year 1981-82, which just ended, outstanding tonnages were recorded at the South Carolina State Ports Authority despite the worldwide recession which began affecting ports in the last half of the year.

Year-end totals show the Port of Charleston handled 3,808,278 tons of break-bulk, container and bulk cargoes. This total is the highest in SPA history and was unexpected considering break-bulk cargoes declined during the year by 15.67 percent. Container tonnage, which rose by 15 percent and near-record grain tonnage more than made up for the break-bulk decline. Overall tonnage for SPA facilities in Charleston, Georgetown and Port Royal was 4,115,465.

Container cargo totaled 1,870,358 tons. The Wando Terminal, with one berth operating since last November and two others since May, contributed 239,760 tons with business increasing rapidly. Container tonnage registered just below the 1979 record high of 1,895,498 tons, indicating full recovery in just one year from the collapse in 1981 of Seatrain Lines which was by far Charleston's largest container line in terms of tonnage shipped.

The record achieved by the SPA was primarily registered in the first six months of the fiscal year. Starting in January, the effects of the recession began to be felt as manufacturers worldwide slowed production and, therefore, had lessened shipping needs. The strong first-half activity resulted in only a 2/3 of one percent decline in general cargo for the year, a much better showing than at other East Coast ports. General cargo includes container and break-bulk, which are the Port of Charleston's primary cargoes; the term does not cover bulk cargo, such as grain.

Port of San Francisco orders fourth PACECO PORTAINER* crane

John F. Martin, President of PACECO, Inc., announced recently that PACECO had received an order from the San Francisco Port Commission for their fourth PACECO ship to shore container handling gantry crane. The crane is to be completed in twelve (12) months.

The new crane, a modified A-frame version, will handle 20' and 40' containers and is being specially designed to gantry on curved tracks. The crane will also compensate for slight differences in the height of the two rails. An additional feature is its self contained spreader test unit which allows testing of the spreader from the ground, independent of the cab controls.

PACECO will also provide a special training program for operating and maintenance personnel.

1981 container traffic exceeds 7 million tons mark: Port of Antwerp

From final year figures of the General Management of the port of Antwerp it appears that container traffic in Antwerp scored a good mark in 1981. In all 794,611 TEU were handled, meaning an increase of 9.7% over 1980 (724.247 TEU).

The increase in the number of TEU handled applied to unloadings as well as loadings (although more explicitly for the latter). Moreover, the growth in the number of TEU handled merely concerned loaded containers since the number of empty containers remained at the same level as in 1980.

This resulted in the fact that for the first time in the history of the port more than 7 million tons of containerized general cargo were handled. Indeed, containerized cargo traffic amounted to 7,121,852 tons in 1981; a rise with 1 million tons or 16.3% as against 1980.

As a consequence 23% of the 1981 overall general cargo traffic (31.14 million tons) was containerized.

Incoming containerized cargo traffic amounted to c. 2,871,000 tons while outgoing traffic amounted to c. 4,250,000 tons.

A data processing and communication system to link European ports undergoing first design steps

The European Port Data Processing Association (E.V.H.A.) in Antwerp has announced the award of a contract to the MBB/ERNO consortium for the design of a Data Processing and Communication System to link European ports.

E.V.H.A. is a non-profit organisation established in 1979 to facilitate the consideration of development and utilisation of the most modern information processing techniques in ports.

The MBB/ERNO consortium was formed to bring together the various disciplines needed to establish the requirements for a port and port users' network and have the capability to proceed with the design and implementation on a European scale.

It is comprised of:

– ERNO Raumfahrttechnik GmbH, Bremen

– KAMPSAX International A/S, Copenhagen
– KLM Royal Dutch Airlines, Amsterdam
– CAPTEC Computer Applied Techniques Ltd., Malahide Co. Dublin

With the sponsorship of the EEC, working groups established by E.V.H.A. have addressed studies to such topics as

– the development and launch of a Pilot Network for the exchange of data about vessel movement between participating ports and
– the handling and information processing related to dangerous substances.

These study and pilot phases are precursors to the present project which will draw on the experience gained so far.

The ports participating in these important evolutionary developments as E.V.H.A. members include Amsterdam, Antwerp, Barcelona, Bremen, Bremerhaven, Copenhagen, Cork, Genoa, Hamburg, Le Havre, Naples, Piraeus, Rotterdam, Trieste, Venice and the British Ports' Association for all U.K. ports.

1st-half 1982 cargo tonnage shows 11.2% up: Bremen and Bremerhaven

The 'subdued optimism' of 8 months ago, with which Bremen's Port Senator, Oswald Brinkmann, awaited 1982, has proved to be absolutely justified. Seacargo-handling development for the first half of 1982 in the Bremen ports has more than fulfilled this expectation.

The handling of 13.81 million tons represents a plus of 11.2 percent over the same period for the preceding year. The good result derives from a 24.3% increase in bulk-commodity handling and of 4.9% in general-cargo handling (6.8% for containerised traffic), whereby it must be acknowledged that the general-cargo proportion, to the total handling is–with 63 percent–extremely high. With such figure-increases the Bremen ports had the best result of all German ports.

Port of Gothenburg's 1981 net profit 6.5 m. Kronor

In 1981, the Port of Gothenburg had an operating revenue of 124.5 m. Kronor (1981 117.5 m.) and a net profit of 6.5 m. Kronor against 5.3 m. in 1980.

The throughput of cargo at the port was 21.5 m. tons in 1981 against 22.3 m. tons in 1980.

It is said in the port's annual review that the total unitised cargo trade during the year represented 81% of Gothenburg's general cargo trade in foreign traffic (the same percentage as in 1980).

Gothenburg's share of total Swedish sea-borne exports (excluding oil and iron ore) increased from 13.9% in 1980 to 15.8% in 1981. A comparison, with respect to general cargo only, shows that exports via Gothenburg represented 16.1% of Sweden's total sea-borne general cargo export 1981 (in 1980 14.4%).

Gothenburg's share of total Swedish sea-borne imports (excluding oil) increased from 13.1% in 1980 to 13.7% in 1981. As for general cargo, Gothenburg's percentage of Sweden's total sea-borne general cargo imports was 18.0% in 1981 as against 18.8% in 1980.

Out of total Sweden's total sea-borne oil import, import via Gothenburg represented 35% in 1981, as against 30% in 1980.

The port's fixed assets were valued at 773.5 m. Kronor (768.6 m. Kronor 1980), 583 m. Kronor of which referred to land, buildings etc. and 49 m. Kronor to cranes, vessels, dredgers etc.

Volvo leases more space at Gothenburg's Lindholmen Harbour for growing car export

Gothenburg's Lindholm Harbour is on an eight-year lease to the Volvo car company, which uses it as a car export facility. Recently, another 40,000 m² were added to the Volvo area, making the total terminal area ab. 100,000 m².

11% cargo increase during January-June: Port of Gothenburg

During the first half of 1982 the cargo passing through the Port of Gothenburg increased with 11% compared with the same period 1981–or from 9,896,000 tons to 10,968,000 tons.

The throughput of mineral oil products rose from 2,965,000 to 4,157,000 tons, while parcel goods remained at about the same level, 3,300,000 tons, as the year before.

Investment continuing throughout the Port of Hamburg

Even though at the moment the economic situation provides little cause for inordinate joy, an optimistic mood dominates in the port. Investment, expansion and modernisation is going ahead here without interruption. The city-state of Hamburg is cooperating closely with port economy enterprises to ensure that also in the future the port will lose nothing of its competitiveness and can always point to its top position in the field of technical progress.

The many investment measures currently in progress not only cover the expansion and modernisation of terminals and other handling facilities, that is to say, taking into account progressing structural changes in goods transport, but aso serve to create new capacity.

All of these activities are safeguarded by the new Port Development Law, which Hamburg's state parliament recently unanimously approved. The law establishes the legal preconditions for the spatial extension of the port region and ensures that existing firms can be expanded and

resettled.

Short-term positive effects are already expected to result from a 100-million DM supplementary programme of the Hamburg Senate, the state government. This is intended to finance further infrastructure measures in the port, which in turn are the prerequisite for private suprastructure measures with appropriate subsequent investments on the port economy's part to the tune of some 150 million DM. The funds are distributed among three major projects.

1. At the quayside surfaces which form the boundaries of the "Kaiser-Wilhelm-Hafen" harbour basin there are at present the terminals of two companies: the Unikai Hafenbetrieb GmbH, a subsidiary firm of Hapag-Lloyd, and the Hamburger Hafen- und Lagerhaus Akt. Ges. (HHLA). Both companies have agreed to operate the terminal jointly in future as a multi-purpose terminal, and to concentrate container handling on one of the two quays. This makes it necessary to demolish two quayside sheds and half of another and to build a new quay wall with berths for three container ships.

2. At Reiherstieg (in the eastern part of the port) Messrs. Gerd Buss intend to build a multi-purpose terminal which, in addition to handling conventional and break bulk type general cargo, will also serve for the storage and processing of wood, steel and non-ferrous metal products, as well as the seaworthy packing of cargo. The plans envisage two berths for seagoing vessels, with water depths of 12.5 metres.

3. The Neuhof Hafengesellschaft mbH, which operates a special terminal for suction cargo close to the Köhlbrand Bridge, is expanding its facilities by one transit quay. This is intended to be used exclusively for loading outgoing ships—for instance with imported grain or feedstuffs, to be passed on in maritime transit, e.g., to Baltic Sea countries, or with German export grain. These ships can be loaded at an hourly rate of 1,200 tons, either from a discharging bulk carrier or from a silo. The provision of water depths for seagoing ships, inclusive of necessary protection of the Köhlbrand Bridge against collision with ships, will also be financed from the Senate's supplementary programme.

Additional container terminal in eastern port section

Among the most important infrastructure building projects which have already been in progress for some time is the deepening of the Northern Elbe with the object of making the eastern (and older) section of the port also accessible for large seagoing ships.

A consequential effect of these comprehensive port engineering measures is already recognisable. The Hamburger Hafen- und Lagerhaus Akt. Ges. (HHLA) is redesigning the fruit centre it operates at the O'Swaldkai as an all-purpose terminal. In future, in addition to refrigerated and large-hold pallet ships for fresh fruit transport, and besides conventional freighters and ro-ro vessels, full container ships will also get the best possible type of dispatch here. The first container gantry crane—transferred here from the Container Terminal Burchardkai—has already been erected, and a second will follow in 1983.

Consultancy report for 1981: Port of Le Havre

During 1981 the Port of Le Havre continued to use its major project-study resources and wide experience of everything to do with ports to provide technical assistance and consultancy services in many fields, especially:

- the design and construction of major new works and equipment,
- port operation,
- port management and organization.

In cash terms, the turnover of the consultancy department in 1981 amounted to more than 7.4. million francs, representing fifteen or so engineers, executives, economists and technicians in full-time employment on project-study services.

The projects they worked on were spread around the world in the proportion of:

- 20% for Metropolitan France,
- 20% for French Overseas Departments and Territories,
- 60% for Foreign Countries.

The foreign countries concerned in 1981 were Cameroon, Egypt, Mexico, South Korea and Liberia.

The Port is continuing its consultancy work during 1982, with the aim both of contributing to the national export drive and of reinforcing still further the links which bind it to other ports around the world, while at the same time enhancing Le Havre's reputation in maritime circles for its technological as well as for its trading prowess.

Throughout the year the Port of Le Havre attracts visitors from all over the world, either singly or in groups. In 1981 our Public Relations Department escorted 11,917 visitors around the docks, a big increase on 1980, when 8,650 people were officially welcomed.

The Antifer belvedere, with its splendid view over the oil terminal, also proved highly popular again in 1981, with 76,469 entrances recorded, a comparatively small drop on the 1980 figure of 83,555.

In addition, some 3,000 people used the "Guide Yourself" cassette service provided by the Port Authority, bringing the total number of visitors officially recorded during the year to about 92,000.

New containers may boost horticultural exports : Auckland Harbour

The DSIR's Auckland Industrial Development Division and the Shipping Corporation of New Zealand are developing two new types of container for horticultural products. The development involves applying simple land-based techniques of crop storage and transport to containerization.

The new containers are the 'forced ventilation' type and a new 'modified atmosphere' type.

The 'forced ventilation' container is a general purpose cargo container modified by the addition of an electric fan which sucks in outside air, passes it over the produce, then pushes it out through exhaust vents in the side. The method enables a normally breathing 'live' crop such as onions to experience 30 complete fresh air changes per hour.

Successful trials have been completed with exports of onions and potatoes to the Pacific Islands and Japan. Five of these containers, filled with onions, travelling on the *New Zealand Pacific* will show whether they can be used for exports to Europe and the United Kingdom.

Member of the development team and Auckland Market-

ing Development Manager of the Shipping Corporation, Mr. John Lovegrove, said this was the real objective of developing the container. Normally horticultural crops required refrigeration on the way to Europe, involving high cost.

Success with the other type, the 'modified atmosphere' container, will be particularly important to growers of stonefruits such as apricots, nectarines, peaches and cherries. The cost involved in the present method of air freighting these products in small quantities is a major limiting factor on the quantity exported.

The modified atmosphere container works by controlling the gases and temperature within the container. This will allow some crops to be shipped in sea voyages lasting up to five weeks.

Trial shipments of this type of container will take place next year and it is hoped to have the system in full commercial operation by 1984.

Port of Brisbane undertakes bay and channel investigation

DRY BULK CARGO SHIPS UP TO ABOUT 200,000 D.W.T. COULD BE ENTERING THE PORT OF BRISBANE IN THE NEXT FIVE TO TEN YEARS.

Chairman of the port of Brisbane Authority (the Hon. A.M. Hodges) said: "Against that very real possibility, the Authority now is studying Moreton Bay Channels, not only to determine where and how they should be deepened, but also to select an alternate, deep water and shorter route into the bay."

Mr. Hodges said the most likely shorter route into Moreton Bay was the North East Channel, around Cape Moreton.

"If it can be deepened successfully, ships coming from the south will save a round-trip distance of 50 nautical miles and up to a total of four to six hours in actual travelling time". he said.

That was a considerable saving in modern shipping terms, he added.

Mr. Hodges said the larger ships which the Authority believed would be using the bay and port in the future would be handling export cargoes such as coal and grain, and import cargoes of mineral ores.

Mr. Hodges said the project was just one of several important priority tasks which the Authority had in hand.

He said: "For instance—a coal loading facility is due to start operations on the Fisherman Islands before the end of the year General construction is almost finished.

"But—already, we're looking at the construction of an even bigger export coal installation.

"Other major projects also are being investigated. These include an export grain installation and facilities to handle imported bulk cement".

Mr. Hodges said the foregoing represented only a part of the Authority's initiatives and responsibilities.

Since early 1977, the Authority had planned, financed and supervised the opening up of the river mouth as a port site where two international-class container terminals had been built. The cost to the Authority now was in the region of $60 million without any subsidy from the Government.

Mr. Hodges said it also was worth noting that—against world trends—the Port of Brisbane's trade is increasing almost every year.

Even the number of ship-calls is improving—1217 for the 81/82 financial year, up 11 percent over the 80/81 figure.

World No.3 in container : Hong Kong

Hong Kong is the third largest container port in the world after New York and Rotterdam, said the Chief Secretary, Sir Philip Haddon-Cave.

The throughput of containers at the Kwai Chung container terminal was 1.6 million TEUs last year, he said.

Sir Philip recalled that two decades ago, when he arrived in Hong Kong, only 6,000 ocean-going vessels used the harbour each year compared to the 10,700 last year.

Turning to air travel, Sir Philip said that the number of passengers using Kai Tak had increased from 600,000 then to 8.2 million last year, while passengers to and from Macau had risen from 1.2 million to 7.3 million.

Asean ports meeting to be held in Kuala Lumpur

The eighth APAA (Asean Port Authorities Association) meeting will be held in Kuala Lumpur from 8–11 November. Port Kelang will be the secretariate for the Association for the 1982–1983 term. Appointed as chairman of APAA for the term is Director General En. Mohd. Hashir Hj. Abdullah and Secretary En. Mohamed Abdul Hamid is APAA's executive secretary. The chairman is elected from among the members of the Association while the executive secretary, who is appointed by the chairman, is usually from the Port Authority which undertakes the duties of the secretariate for the term.

APAA, a regional organisation of government port and harbour authorities was formed in September 1975. Among the objectives of the Association are to promote and assist in the development and implementation of efficient cargo handling methods, port procedures and documentation, to exchange data and information on shipping and cargo traffic and to train port personnel on various aspects of port management.

Examples of the regional cooperation is seen in the various programmes adopted by the Association, among which is the simplification of port documents which has already been adopted by APAA at its seventh meeting held in Surabaya in December of last year.

The meeting is expected to review the projects under the APAA programme. These projects include the handling of dangerous goods and the port personnel and information exchange programme.

Also to be reviewed will be the study, assisted by EEC, on container terminal operation in Asean ports and a comprehensive study on containerisation to be undertaken with the assistance of the United Nations Development Programme (UNDP).

The meeting is also expected to examine the position of the Association in the whole Asean machinery and its role in implementing the projects under APAA.

Five country papers will also be presented at the meeting. Indonesia's paper will be on its inter-island trade and passenger service. The Philippines will be present a paper on training needs for national requirements in relation to ports, Singapore's paper will be on computerisation of the container terminal, Thailand's on stevedoring services

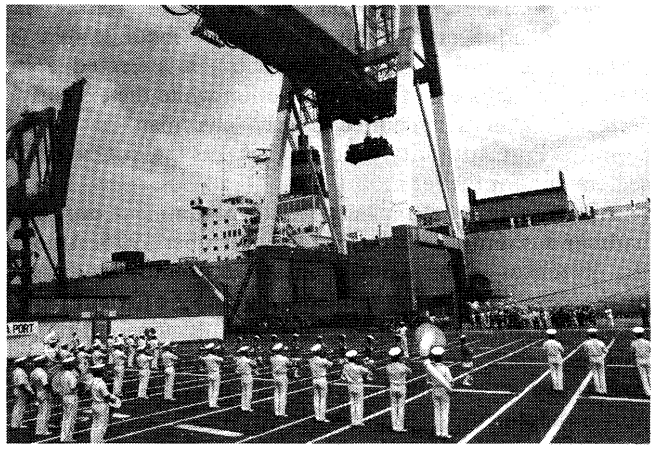
public or private control while Malaysia's paper will be on security, health and safety in the Malaysian ports. *(WARTA-Kelang Port Authority)*

Nagoya-Europe weekly service by container ships

Port of Nagoya, on September 5, 1982, welcomed the arrival of Scan-Dutch's full container ship "Nedlloyd Delft" (58,613 grt) and celebrated the commencement of weekly service to Europe, the realization of which had been a long awaited target of the Port.

Port of Nagoya, since it received the first full container ship "Hakone Maru" of NYK in 1968, has been trying to expand the Port's capability of serving regular container routes, but without succeeding in inviting Europe bound container liners.

The commencement of this weekly service to Europe would greatly contribute to the advancement of broader economic ties with the EC countries and Nagoya and its hinterland, said Mayor Masao Motoyama of Nagoya (President of NPA), at a welcome reception jointly organized by NPA and Nagoya CCI and others, at an NCB (Nagoya Container Berths Co., Ltd.) terminal on September 5, 1982.



A welcome parade by the Aichi Prefecture Police Band in commemoration of the first weekly service by Scan-Dutch I/S (Partnership) consortium.

Mina Qaboos plans for bulk carriers

Oman's major port–Mina Qaboos–is poised to take a major step forward. Indications are that it will be able to handle bulk carriers by the end of the decade. Experts from Maunsell Consultants are already working on the proposed expansion scheme, which will create construction jobs worth $173.91 million.

The plan is to build an additional basin beyond the existing breakwaters, along with more storage space created by blasting an area through the nearby mountains.

The expansion scheme is based on the projection that by the end of 1992, Mina Qaboos will handle 120,000 teus and that most of the general cargo and food stuffs will be containerised. Currently the type of vessels calling at Mina Qaboos go up to a maximum of 30,000 dwt with maximum length 250 metres and draft 11 metres. But the situation is expected to change in line with the pace of economic activity. It is envisaged that bulk carriers of up to 80,000 dwt with length up to 270 metres draft up to 15 metres will be calling at the port in the next ten years.

For centuries, Muscat has been an important port. Muscat literally means "a place of falling or anchorage" and ships trading between east and west used to stop there to replenish essential commodities to load dates and limes.

Mina Qaboos is managed by the Port Services Corporation Ltd., whose capital is made up from government and private sector funds, thus ensuring a commercially-oriented undertaking. The board of directors is headed by the Minister for Communications Sayyid Salem Bin Nasser Al Busaidi and day-to-day affairs are looked after by the general manager, Awad Salim Al Shanfari.

The port has nine deep-water berths, three coaster berths and one berth for launches. They vary in length from 76 metres to 22 metres and are sheltered by a breakwater on one side and cliffs on the other. Nine berths can take vessels of up to 10.4 metre draft and the remaining three are reserved for shallow draft vessels drawing 4 metres of water. A new container terminal was created at a cost of $15.94 million and it is operating with two 35-tonnes gantry cranes, five 35-tonnes forklifts and a Maf 1 type roll trailer system backed up by mobile cranage of up to 150 tonnes capacity. The port is also equipped with Ro-Ro handling equipment. *(Gulf News from the Gray Mackenzie)*

Port development work begins: Port of Karachi

Construction work under the master plan prepared for the development of the port of Karachi is expected to commence during the current financial year (1982-83).

Under the plan, the first set of eight berths including modern container terminals, will be brought in use during 1987-88, adding about two million tons of dry general cargo capacity to the port the estimated cost of the project is Rs. 1,000 million.

Meanwhile, construction of 75,000 dwt oil tanker berth in the lower harbour, the dredging of the harbour approach channel and the procurement of trailing suction hopper dredger has already been completed. The project has doubled the port's oil handling capacity from 5 million tons to 10 million tons per annum. The third project, Scheduled for completion by end of 1982, will increase the port's equivalent dry general cargo handling capacity by about 1 million tons to an aggregate of 6 million equivalent dry cargo tons per annum and container handling capacity to one lakh tons.

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Container Handling in Singapore — Present and Future —

The inauguration of the first container berth on 23 June 1972 marked the beginning of a new era of cargo handling in Singapore. The Tanjong Pagar Container Terminal at East Lagoon presently occupies an area of some 50 hectares, comprising six main berths (inclusive of a ro-ro berth) with a total quay length of 1,909 metres and a feeder berth of 238 metres. The container stacking yard available now is capable of accommodating more than 31,000 TEUs of containers.

In 1981, the six PSA gateways handled a total of 31.4 million tonnes of general cargo of which 47% were containerised. Containerised cargo is expected to surpass conventional cargo by 1983 and constitute 60% by 1988. Out of 1,121,500 TEUs of containers handled by PSA last year, 987,800 TEUs (88%) were moved through the Tanjong Pagar Container Terminal. Over the past five years, the number of containers handled at the Container Terminal has been increasing at a compound rate of 35% annually. Container traffic is expected to grow at 20 to 25% per annum over the next five years and reach a throughput of 2 million TEUs and 3 million TEUs by 1986 and 1990 respectively.

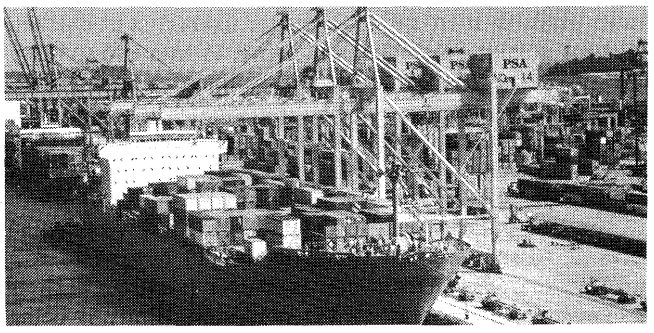
Over the past decade, the Tanjong Pagar Container Terminal has handled a total throughput of 4,616,000 TEUs. Catering to this explosive rate of growth has not been without its problems. Singapore has learned that in a fast growing activity, it is necessary to make plans based on optimistic traffic forecasts rather than on pessimistic ones, if high service levels are to be maintained. There must be judicious and timely investments in berth construction, purchases of new container handling equipment, extensions and improvements to backup facilities in order to systematically keep up with the container cargo growth.

Development and operations in Singapore tend to be relatively more intensive than in most other ports. This is because of the scarcity of land and manpower, the peculiarities of Singapore's own operating environment. It has been possible for us to obtain an annual throughput of some 2.5 million tonnes of cargo per container berth by working round-the-clock and assigning as many as 4 quay cranes to a berth at the Tanjong Pagar Container Terminal.

High priority has been accorded to the expansion of the container facilities, improvement of level of services and computerisation of container handling to cope with the expected increase in container traffic.

Present development works include the conversion of three conventional berths to two container berths measuring 535 m. Two drydocks in the area will be decked to form part of a 27-hectare marshalling area for the two berths. The conversion work began in the middle of last year and the first berth will be commissioned in April 1983 with the second berth in July 1984. The project will cost about $216 million.

The 'voids' behind two existing container berths have been decked at a cost of S$43.4 million to yield a stacking area of 9.7 hectares. Another 5.3 hectares of backup space will be available behind Berth No. 55 by the end of this year.



Three or four cranes are deployed at each berth to turnround ships fast. Average turnround time is now 10 hours.

Yard gantry cranes stacking containers at the Tanjong Pagar Container Terminal.

Additional yard stacking space will also be created by the demolition of existing container freight stations at the Terminal. To replace these freight stations, two warehouses at Telok Ayer Wharves have been converted for stuffing and unstuffing of LCL containers. The ground floor of two blocks of five-storey warehouses now under construction at Keppel Wharves will be available for LCL operations by the 4th quarter of 1982. A large container freight station and multi-storey warehouse complex is being planned on some 22 hectares of land bounded by Keppel, Kampong Bahru and Nelson Roads. This project will be implemented in stages and is expected to be completed in five to six years' time. The complex will be declared as a free trade zone and linked to the port area by an overhead bridge. It is expected to cost about $170 million.

Running parallel to the development of wharf facilities is the huge investment in container handling equipment. The existing equipment includes 16 quay cranes, 36 yard gantry cranes, 20 straddle carriers, 111 towheads, 234 chassis, 11 freightlifters, 5 heavy forktrucks and 94 forklifts. Another 5 yard gantry cranes would be added to the fleet in 1982, 2 quay cranes will be added next year with an additional two in 1984.

Since 1973, an on-line computer system has been introduced to keep an inventory of containers in the yard and to produce bills and documents to facilitate container operations. With the rapid growth in container traffic, the computerised system has been expanded in order to provide more and better service to support the operations and to make available more information for management control. Stowage planning including calculation of trim and stability of container vessels, yard allocation, unpacking and delivery of LCL cargo, loading tickets, discharging lists and duty roster of the Terminal staff are all computerised. An on-line enquiry system for the port users to facilitate container delivery is also provided.

The computer will also be used to improve existing services, to support new functions and to expand to new areas so that requirement for expensive resources such as manpower can be kept to the minimum. Study is being made to computerise the packing operation in the Container Freight Stations, to provide computer controlled information on transfers and automatic capturing of locations of containers in place of manual effort and voice communication. It is also proposed to link the computer system to shipping lines and freight forwarders.

As part of our computerisation programme, all the new container quay cranes will be installed with micro-processors for trouble-shooting purposes. The faulty modules of the cranes can be easily identified to minimise the breakdown time.

After the completion of the development works at East Lagoon in 1984, the PSA Tanjong Pagar Container Terminal will occupy an area of more than 100 hectares with 8 main berths and 1 feeder berth. These berths with a total of 20 quay cranes will have a handling capacity of 2.3 million TEUs per annum. To cope with the anticipated container traffic in the late 80s, PSA is studying the feasibility of developing container berths at Pulau Damar Laut and Pulau Brani, two offshore islands close to the mainland. Development cost is expected to be about 500 to 600 million for each of these projects.

Cargo and number of containers and cargo handled at the Port of Singapore Authority's six gateways

Year	TEUs	Freight Tonnes
1972	24,515	410,804
1973	126,714	1,797,675
1974	191,930	2,432,549
1975	232,321	3,194,787
1976	342,956	4,738,834
1977	393,230	5,731,648
1978	562,287	8,449,815
1979	732,108	10,259,695
1980	967,962	12,549,487
1981	1,121,576	14,673,144
1982 Estimated	1,263,500	17,280,000

Cargo and number of containers and cargo handled at Tanjong Pagar Container Terminal

Year	TEUs	Freight Tonnes
1972	14,000	184,900
1973	97,900	1,404,000
1974	153,400	1,900,300
1975	191,600	2,565,500
1976	295,200	3,902,900
1977	344,200	4,908,200
1978	498,800	7,347,500
1979	663,500	9,049,100
1980	865,000	11,030,500
1981	987,800	12,859,900
1982 Estimated	1,192,000	15.38 million tonnes

World economic conditions reduce level of activities for first half of 1982: Port of Singapore

Growth rates in all aspects of port activities slowed down during the first half year of 1982 as compared to the corresponding period last year. This shows the effect of the economic situation of the Western industrialised countries on Singapore's international trade.

The Port handled 51.8 million freight tonnes of cargo in the first six months of this year, an increase of 15.4% over the 44.9 million freight tonnes last year. Mineral-oil handled by the refineries totalled 31.4 million tonnes up by 15.8%. Imported oil amounted to 19.4 million tonnes while the refineries exported 12 million tonnes of petroleum products in the first six months. Last year for the same period, the figures were 16.4 million tonnes and 10.7 million tonnes respectively. General and other bulk cargo handled by the Port amounted to 17.1* million tonnes, nearly 2 million tonnes more.

Ships arrivals and departures numbered 30,518 while the shipping tonnage totalled 276 million gross registered tonnes. The number and tonnage increased by about 11%. At the PSA's gateways, 20.4 million tonnes of cargo were handled. For the first time since 1981, the growth rate of conventional cargo was high than that of containerised cargo. Non-containerised cargo grew by 15.5% while containerised cargo increased by less than 10%. This could be attributed to the prevailing economic conditions in the industrialised countries whose exports are mainly containerised.

The gateways handled a total of 585,632 TEUs during the first half of 1982, 6% more. The Tanjong Pagar Container Terminal, the main gateway for container traffic accounted for about 88% of this traffic–514,100 TEUs. The throughput at Tanjong Pagar Container Terminal was 5% more than that for the corresponding six months of last year. This was the first time since 1972 a single figure increase was achieved at the terminal. The total tonnage moved at the Terminal was 6.8 million freight tonnes, 8.0% more than last year.

Performance during the first half of this year confirms the PSA's forecast of a drop in the level of activities because of the slow down in world trade. The PSA plans to take advantage of the lull in its activities to redevelop some of the older port facilities and to test out changes in the work systems.

*Does not include statistics of traffic to and from some countries.

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