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Discussion Paper No. 14

# THE ECONOMICS AND REGULATION OF COASTAL SHIPPING IN PAPUA NEW GUINEA

by
SIDNEY GILMAN

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# THE ECONOMICS AND REGULATION OF COASTAL SHIPPING IN PAPUA NEW GUINEA

By

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# FOREWORD

This Discussion Paper is principally about the mainport freight sector of the coastal shipping industry. It will attract relatively narrow but specific interest - from those few firms who are ship-owners or shippers, and from the government in its diverse roles as industry strategist, regulator, direct investor, and minder of its (wage fixing) institutions. Mr. Gilman finds a high cost industry. Excess and inappropriate tonnage, ad hoc regulation, and anomalous wage fixing all contribute. He notes, however, the inherent difficulty in matching supply to a demand which is changing in volume and mix. He notes also the advances that have been made during the 1970's and the entrepreneurial role of government in this regard but with its attendance financial costs. Those who saw in a previous I.N.A. Discussion Paper ("The Role of Public Enterprises in Papua New Guinea" by Michael Trebilcock, 1982) substantive reasons for limiting government involvement in the economy will find in this paper further grist for that mill.

Mr. Gilman sees the most serious weakness in the government's role as industry strategist. He proposes a medium-term strategy which would put more joint responsibility on ship-owners and shippers. Government may be skeptical about the capacity or the will of the industry to regulate itself. Neither is it certain that ship-owners and shippers with substantial investments in particular technologies will wholeheartedly endorse this principle. There is nevertheless a clear challenge to the industry to organise itself in a way appropriate for discussions with government that will lead to lower transportation costs in final consumer prices.

This "micro" study highlights (as did "Issues in Papua New Guinea Forest Policy" by A. I. Fraser, 1981 before it, and more so than with "macro" studies) the fundamental dilemma facing the Institute of National Affairs. Through its efforts it hopes to begin the debate which will result in changes to the very system from which it draws its support. It cannot take for granted continuing support from the new system so created. On the other hand if its efforts fail to produce change it will question its own raison d'etre. Council has approached this dilemma by pursuing independence and objectivity in its research. Thus, whilst some industry participants will find this paper not entirely to their liking they can be assured that it is not the result of bias.

Council thanks Mr. Gilman for his contribution to the work of the Institute of National Affairs and to the economic development of Papua New Guinea.

Port Moresby
November 1983

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## ACKNOWLEDGEMENTS

In carrying out this study there was a substantial requirement for information both on the characteristics of supply and demand and also on cost structures and the operation of the present pricing and regulatory systems. In meeting this requirement I found that the statistics of freight and passenger movements produced by the Department of Transport and Civil Aviation were of very great value, in fact they provided the essential first step in the analysis. Following on from this, members of the Papua New Guinea Shipping Association and of the individual lines were extremely helpful and generous with their time providing me with a great deal of information and assisting with the essential understanding of the logic of the operational patterns employed within the industry. The Harbours Board, together with agents and stevedores were helpful in providing information on ports and cargo handling, whilst in dealing with policy and regulatory issues I am grateful to the officials in the Department of Transport and other Ministries, as well as managers within the industry itself and shippers and consignees.

I am also particularly grateful to Chris Mackay of the Institute of National Affairs, without whose help the organisation of the work and interview programmes would have been quite impossible, and to Mrs. Jocelyn Millett who was able to produce a succession of drafts from very rough copy and greatly facilitated the progress of the study. I am also very grateful to them and to Councillors of the Institute of National Affairs for the hospitality and personal kindness shown to me during my stay in Papua New Guinea.

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# INTRODUCTION

This report arises as the result of an invitation from the Institute of National Affairs to undertake an investigation into the coastal shipping industry of Papua New Guinea. The main aims were to consider economic performance and regulatory policy, although in order to do this it was clearly necessary to undertake a systematic review of the characteristics of demand and supply. Following discussions to determine the precise scope of the study, field work was carried out during March and April 1983 and a draft report was produced. Following the receipt of comments this final report has been produced at Liverpool University.

In carrying out the review of the industry a start is made with demand, the basic statistics of traffic between port pairs being presented in a form related to the operational patterns employed within the industry. The analysis then moves on to consider supply starting with the presentation of information about present fleets and operating patterns. Following this in Chapter 3 there is an analysis of the main components of economic efficiency and the issues at stake in this respect. The first of these concerns the choice of ship and cargo handling technology and in this area the extent of use of containers is clearly an important issue. A related issue concerns the size of ship in the coastal trades as, where traffic densities permit, economies of size may be of great importance. These two are related, as fast cargo handling is required in order that economies of size at sea should not be eroded by excessive ship time spent in port. A further important factor concerns the way ships are deployed and the efficiency of the route structures operated. Finally, there is the question of the balance between supply and demand and the extent of any overtonnaging which may exist.

Within the coastwise trades of Papua New Guinea two main sets of freight traffics may be identified. The first of these concerns main port trades, or rather that central core of traffics between Port Moresby, Lae and the islands which may in principle be encompassed within one coherent shipping service. In this sector, which represents something over half of the general cargo moved, all of the issues mentioned above are important. In the remaining sectors (which include the main port feeder trades, together with those main port trades outside the scope of the central service mentioned above), the flows are fragmented, individual route structures are rather more straightforward, and the competitive situation is also less complex. Thus, although these areas are important in terms of tonnages of freight moved in total, the policy issues are not at the moment so pressing. The same applies to recorded passenger traffic, which may be of considerable social importance, but where movements are relatively light, affecting only a small proportion of the population. For this reason, and given the fact that only a limited time was available for the study, this report concentrates on the core main port trades as defined above, although the other areas do receive statistical coverage as well as some analysis.

Two further points must be made here. First, this is necessarily a rather technical study, as many of the important economic and regulatory issues can only really be dealt with after the technical and operational context has been explored. An attempt has been made to explain the approach and present the material in a form accessible to the lay reader, but there must necessarily be limits to the explanation of methodology which can be incorporated without making the report excessively long and diffuse. Although the study is in parts rather technical, the implications are essentially economic. Coastal shipping is very expensive in Papua New Guinea, it absorbs a significant proportion of personal and national income and the high level of costs which affect all sectors of the economy must inhibit political and economic development and reduce employment opportunities. High wages in the port and shipping sectors may also help to fuel inflationary tendencies in the economy as a whole. The aim of this study, therefore, is ultimately to help in the formulation of policies which will improve the economic efficiency of the coastal shipping industry and thereby the well being of the nation.

Finally, it is necessary to comment on the nature of the conclusions which may be expected from a study of this type. The study applies to a mixed industry with both private sector and government participation, but one which is regulated by the government. It is quite feasible to conduct an analysis which leads to identification of improved technology and operating patterns and as it happens the outcome of this analysis is reasonably clear. It also leads on to suggestions which may be made for government policy which are quite clear cut. However, it is not really possible to go beyond this and make precise recommendations about ships and operating patterns. Each company within the industry has its own approach and is operating within financial constraints and commitments to existing tonnage. For many years these companies have been competing with each other. Given the way the industry is organised at the moment, the precise choice of technology and operating pattern must be a matter for the lines either working individually or, if possible, collectively, to provide a rationalised efficient service. After all they make the investment and take all the commercial risks. Thus although this report makes firm suggestions with respect to government policies and certain aspects of port policy, it stops short of making similar recommendations with respect to ship choice, the operating pattern to be applied in the coastal trades, or the ultimate composition of the industry.

## GLOSSARY

| | |
|---|---|
| General cargo: | The varied cargoes moving in the liner trades. They are in a wide range of parcel sizes, but always less than full ship lots. |
| Conventional system: | The pre-container method of handling general cargo. |
| Break bulk: | Non unitised general cargo. |
| Block stow: | Unitised cargo stowed in blocks chiefly semi-bulk cargoes, but includes containers when not in cell guides. |
| Lo-Lo: | Lift-on-lift-off. |
| Ro-ro: | Roll-on/roll-off. |
| Cellular containership: | Ship equipped with cell guides in all holds to facilitate container handling by lo-lo methods. |
| Multi-purpose coaster: | A ship designed to carry containers in the holds and on the weather-deck, but without cell guides, so that non-containerised cargoes can also be carried. |
| Container/ro-ro: | A container ship, which combines ro-ro and lo-lo cargo handling methods and can also carry non-containerised cargo. |
| Conbulker: | A combination bulk carrier/container ship. |
| Weather deck: | The top deck of a ship which keeps the weather out. |
| Hatch covers: | That (re)movable part of the weather deck which covers each hold, protecting it from the elements. Cellular ships have removable lids known as 'pontoon' hatch covers. Multi-purpose ships may have folding hatch covers. |
| Tank top: | The bottom deck of a ship above the tanks. |
| Shelter-deck/tween deck: | An intermediate deck between the weather deck and the tank top. |

| | |
|---|---|
| Container Exchange: | The sum of containers loaded and discharged. |
| Self-sustaining: | Refers to ships with onboard gear (craneage) or ramps and fork lift trucks or trailers, giving the capability to load/discharge independently of shore based facilities. |
| Ships' gear: | Cranes or derricks carried onboard ship. |
| Gantry: | A heavy high capacity crane which can move laterally on rails. |
| F.E.L.: | Front End Loader. A large container handling truck based on fork lift concept. |
| dwt: | Dead weight tonnes. |
| Bale space: | The cargo capacity of a ship when loaded with bales (as opposed to a cargo like grain, which will flow into every crevice). |
| FCL: | Full Container Lots, i.e. containers stuffed by the shipper and stripped by the consignee. |
| LCL: | Less than Container Lots, cargo handled by container but consolidated and broken down into smaller parcels in depots. |
| Reefer: | Refrigerated. |
| Liner Service: | A frequent regular service on an established itinerary. |
| Multi-port Operation: | A route itinerary having several port calls at either end of the route. |
| Revenue Tonnes: | Cubic metres or tonnes-weight depending on the basis on which freight rates are levied. |
| TEUs: | Twenty Foot Equivalent Unit. Capacity or throughput measured in containers of 8' x 8' x 20' - or more usually nowadays 8' x 8'6" x 20'. |

# CHAPTER 1 - TRAFFIC FLOWS

The Division of Marine of the Department of Transport and Civil Aviation instituted a statistical service for coastal cargoes in 1979. It is based on returns which is mandatory for ships to make on the cargo carried on each voyage, and presented in sets of matrices. These cover traffic between all main port pairs between main ports and feeder ports and between feeder ports themselves, although necessarily this is shown in rather less detail. The statistics are accepted as being reasonably accurate and are right up to date providing an excellent picture of the structure of the main cargo flows.

Within each group there are three classes of goods, general, freezer and bulk liquid and of these general cargo is by far the most important. A good view of the dry cargo sector may, therefore, be obtained by concentrating on main port to main port, and main port to feeder flows, for general cargo, and the statistics for these are presented in Tables 1.1, 1.2, and 1.3 below.

Table 1.1 shows the intra main port flows taken from the Department statistics but re-arranged from alphabetical order to one which is rather more closely aligned with the transport geography of the system and the route structures operated. The main port system may be considered in broad terms to consist of the coastwise horseshoe from Port Moresby to Lae, (which may sometimes be extended up the north New Guinea coast to include Madang), plus a loop out of Lae which covers services to the islands and includes chiefly the ports of Rabaul and Kieta - although Kavieng may be included without too much of a diversion.

The main flows of cargo are from Port Moresby around the coast to Lae, (with the largest flows being between the two main ports themselves), plus Moresby to the islands, and finally Lae to the islands i.e. Rabaul, Kavieng and Kieta. In 1981 there were 250,000 revenue tonnes moving in this system as a whole of which about 120,000 tonnes moved on the Moresby-Lae sector, some 17,000 tonnes from

Moresby to the islands and 50,000 tonnes from Lae around the islands. Most of the rest moved along the north New Guinea coast from Lae to Vanimo - some 37,000 tonnes and from Rabaul to Kimbe and Vanimo - some 10,000 tonnes. Thus there are four large ports in the system Lae, Moresby, Rabaul and Kieta, the rest being very much smaller, although still classed as main ports.

Figures for the main port feeder services are taken straight from the Department of Transport statistics in which the structure of the trade is clear enough. The main flows are from Port Moresby to the west and the Gulf of Papua, some 37,000 tonnes outbound and 14,000 tonnes inbound, and from Rabaul to the islands some 32,000 tonnes outbound and 25,000 tonnes inbound, with a subsidiary flow from Lae to the nearby areas on the New Guinea coast. There is some double counting in terms of tonnes of freight moved in that some of the feeder traffic is first moved between the main ports. However, in transport terms it is necessary to show all flows, whether transhipped or not.

## TABLE 1.1

## COASTAL TRAFFIC - MAIN PORT TRADES IN GENERAL CARGO (REVENUE TONNES) 1981

| From/To: | Port Moresby | Samarai | Alotau | Oro Bay | Lae | Madang | Kavieng | Rabaul | Kieta | Sub Total | Wewak | Vanimo | Kimbe | Lorengau | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Port Moresby | - | 3,285 | 4,824 | 1,724 | 17,656 | 2,470 | 60 | 6,229 | 5,285 | 41,533 | 1,484 | 3 | 503 | - | 43,523 |
| Samarai | 673 | - | 339 | - | 42 | - | - | - | - | 1,054 | - | - | - | - | 1,054 |
| Alotau | 786 | 309 | - | 14 | 1,903 | 1 | 77 | 8 | - | 3,098 | - | - | 27 | - | 3,125 |
| Oro Bay | 705 | - | 272 | - | 1,901 | 8 | - | - | - | 2,886 | 18 | - | - | - | 2,911 |
| Lae | 34,457 | 650 | 2,677 | 9,025 | - | 13,215 | 2,523 | 26,680 | 9,956 | 99,183 | 18,601 | 3,188 | 1,837 | 487 | 123,296 |
| Madang | 1,876 | 10 | 71 | 147 | 3,873 | - | 37 | 697 | 836 | 7,547 | 4,277 | 2,345 | 89 | 1,643 | 15,902 |
| Kavieng | 136 | - | - | - | 784 | 4 | - | 1,489 | - | 2,413 | 15 | - | - | 265 | 2,693 |
| Rabaul | 2,451 | - | 18 | 6 | 6,040 | 134 | 6,283 | - | 7,864 | 22,796 | 108 | - | 7,071 | 3,159 | 33,134 |
| Kieta | 3,507 | 3 | 5 | 31 | 4,386 | 238 | - | 1,836 | - | 10,006 | 14 | - | 18 | - | 10,038 |
| Sub Total | 44,591 | 4,257 | 8,206 | 10,947 | 36,585 | 16,070 | 8,980 | 36,939 | 23,941 | 190,516 | | | | | |
| Wewak | - | - | 1 | - | 6,088 | 966 | 6 | - | 9 | - | - | - | 6 | 88 | 7,164 |
| Vanimo | - | - | - | - | 628 | 730 | - | - | - | - | 638 | - | - | 2 | 2,002 |
| Kimbe | 226 | - | - | - | 809 | - | - | 2,139 | 1 | - | - | - | - | - | 3,175 |
| Lorengau | - | - | - | - | 590 | 1,022 | 126 | 575 | - | - | 11 | - | - | | 2,324 |
| TOTAL | 44,821 | 4,264 | 8,207 | 10,947 | 44,701 | 18,788 | 9,122 | 39,653 | 23,951 | - | 25,166 | 5,536 | 9,551 | 5,644 | 250,341 |

Source: Freight Study Bureau, Maritime Division, Department of Transport and Civil Aviation, 1980.

## TABLE 1.2

## COASTAL TRAFFIC - MAIN PORT/FEEDER TRADES IN GENERAL CARGO (REVENUE TONNES) 1981

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM/TO: | WEST. | GULF | CENTRAL | M.BAY | NORTHERN | MOROBE | MADANG | E.S. | W.SEP. | MANUS | N.IRE. | W.N.B. | E.N.B. | N.SOLO | |
| 1 ALOTAU | | | 22 | 1138 | | | | | | | | | | | 1160 |
| 2 KAVIENG | | | | | | | | | | 17 | 140 | | | | 157 |
| 3 KIETA | | | | | | | | | | | | | | 1455 | 1455 |
| 4 KIMBE | | | | | | | | | | | | 13 | | | 13 |
| 5 LAE | | | | 992 | 2534 | 6012 | 73 | | 748 | 45 | | 929 | | 706 | 12039 |
| 6 LORENGAU | | | | | | | 43 | | | | 11 | | | | 54 |
| 7 MADANG | | | | 6 | 48 | 1035 | 1539 | 1149 | 358 | 276 | | | | | 4411 |
| 8 ORO BAY | | | 7 | | 109 | | | | | | | | | | 116 |
| 9 P. MORESBY | 25127 | 12794 | 1504 | 437 | 10 | | | | | | | | | 70 | 39942 |
| 10 RABAUL | | | | | 52 | | | | | 356 | 7990 | 13712 | 997 | 8942 | 32049 |
| 11 SAMARAI | | | 15 | 595 | | | | | | | | | | | 610 |
| 12 VANIMO | | | | | | | | | 27 | | | | | | 27 |
| 13 WEWAK | | | | | | | | 92 | 110 | 19 | | | | | 221 |
| TOTAL | 25127 | 12794 | 1548 | 3168 | 2753 | 7047 | 1655 | 1241 | 1243 | 713 | 8141 | 14654 | 997 | 11173 | 92254 |

Source: Freight Study Bureau, Maritime Division, Department of Transport and Civil Aviation, 1980.

## TABLE 1.3

## COASTAL TRAFFIC - FEEDER/MAIN PORT TRADES IN GENERAL CARGO (REVENUE TONNES) 1981

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM/TO | ALOTAU | KAV. | KIETA | KIMBE | LAE | LORENGAU | MADANG | O/BAY | POM | RABAUL | SAMARAI | VAN. | WEWAK | | |
| 1 WESTERN | | | | | | | | | 2970 | 38 | | | | | 3008 |
| 2 GULF | | | | | | | | | 7489 | | | | | | 7489 |
| 3 CENTRAL | | | | | 545 | | | | 3252 | | | | | | 3797 |
| 4 MILNE BAY | 806 | | | | 382 | | | | 164 | | 164 | | | | 1516 |
| 5 NORTHERN | | | | | 269 | | 5 | | 165 | | | | | | 439 |
| 6 MOROBE | | | | | 3306 | | 678 | | | | | 7 | | | 3991 |
| 7 MADANG | | | | | 57 | | 2425 | | | 66 | | | | | 2548 |
| 8 EAST SEPIK | | | | | | | 322 | | | | | | | | 322 |
| 9 WEST SEPIK | | | | | 152 | | 24 | | | | | 12 | 7 | | 195 |
| 10 MANUS | | | | | | 5 | 29 | | | | | | | | 34 |
| 11 N. IRELAND | | 16 | | | | | | | | 4792 | | | | | 4808 |
| 12 W.N.BRITAIN | | | 2 | | 416 | | | | | 8526 | | | | | 8944 |
| 13 E.N.BRITAIN | | | | | | | | | | 3303 | | | | | 3303 |
| 14 N. SOLOMONS | | 300 | 1099 | | 69 | | | | 102 | 8305 | | | | | 9875 |
| TOTAL | 806 | 316 | 1101 | | 5196 | 5 | 3483 | | 14142 | 25030 | 164 | 12 | 14 | | 50269 |

Source: Freight Study Bureau, Maritime Division, Department of Transport and Civil Aviation.

**The Variability of Traffic Flows**

It is not within the compass of this study to provide traffic projections although it may be noted that a national study of traffic is to be carried out under the auspices of the Department of Transport later this year. Certain major changes, which are taking place within the system or may be pending are, however, worthy of mention and their broad implications may be considered.

The first change, and one which is of major importance, follows the take-over by South Pacific Brewery of San Miguel. As a result of this the very large flow of beer and empties between Moresby and Lae will virtually cease as both brands will be brewed in both centres and Port Moresby now has a two year supply of bottles. Port Moresby will now act only as a distribution centre for Papua including the Gulf and the West, whilst Lae will serve New Guinea and the islands.

A second change of major importance concerns the substitution of certain domestic for imported goods. Chief among these is sugar, and as the Ramu project comes into full production Lae will become the distribution centre for this product. A similar change concerns the development of a domestic industry for poultry which will substitute domestic reefer cargoes originating in Lae and Port Moresby for some of the present imports, although the flows may not be large as poultry farming is likely to spread. Yet a further possible change would be the development of domestic cement manufacture. These changes, will all increase the importance of coastwise distribution relative to imports, and there will always be a potential for substantial changes in the balance of movements as new products come on stream: occasionally there may be a rationalisation of the type that occurred in the brewing industry.

A third major set of influences concerns import and export flows and their inter-relationship with the coastwise trade. There is one substantial change taking place at the moment which arises from the decline in the copra market. It chiefly affects Rabaul, which as well as losing some of its export calls, is declining somewhat as an import centre in favour of Lae as overseas lines trim their itineraries.

Finally, containerisation of the international trades, is in any case associated with rationalisation of itineraries, and the increased uses of feeder and transhipment strategies. Something like this happened in the Papua New Guinea Australia trade back in the 1960's, in this case when the trade went over to pallets and side-port loaders so when containers were introduced on this route there was not too much further potential for change. However, other routes are now containerising, and all deep sea lines might look seriously at an efficient coastwise container service as an aid to rationalisation. Since many deep sea lines review and change operating strategies rather frequently, (some do it annually), transhipment flows are also likely to be volatile.

The overall picture is one of much variability and not more than a low level of potential growth in the system only some of which may be related to the growth of the economy generally. No overall pattern may be discernible in this, although Lae as the industrial centre seems to be increasing somewhat in importance within the system as a whole.

**Coastal Passenger Traffic**

Official statistics of coastal passenger traffic for 1982 are shown in Tables 1.4 to 1.6. Passenger traffic is not associated with the same documentation as that which applies to freight traffic so the reliability of figures may be less certain. However, so far as they go they show a relatively light movement of passengers on recorded coastal ships, there being some 28,000 trips between main ports and a further 36,000 on journeys between main ports and feeder ports. In the main port services there are two main axes, one along the north New Guinea coast and the other between Rabaul and Lae. Feeder main port traffics are also concentrated along the north New Guinea coast. This traffic flow may be in part a reflection of the availability of services. These are provided chiefly by Lutheran, with their combined passenger freight ships providing regular services in New Guinea and also between New Guinea and the islands, and by Coastal Shipping Company, together with Pacific New Guinea Line, operating out of Rabaul.

It is beyond the scope of this study to consider trends or latent demand for coastal travel, although some comment has been made to the effect that there may be unsatisfied demand in Papua. On the other side of this coin road services are beginning to take some of the market on the north New Guinea coast.

## TABLE 1.4

## MAIN PORT PASSENGER TRAFFIC - 1982

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FROM/TO** | **ALOTAU** | **KAV.** | **KIETA** | **KIMBE** | **LAE** | **LORENGAU** | **MADANG** | **O/BAY** | **POM** | **RABAUL** | **SAMARAI** | **VAN.** | **WEWAK** | | |
| **1** ALOTAU | | | | | 59 | | 116 | | | | 5 | | 2 | | 182 |
| **2** KAVIENG | | | | | | | | | | 291 | | | | | 291 |
| **3** KIETA | | | | | | | | | | 1012 | | | | | 1012 |
| **4** KIMBE | | | | | 779 | | | | | 1357 | | | | | 2136 |
| **5** LAE | 12 | 5 | | 731 | | 48 | 561 | 604 | | 2231 | 2 | 9 | 248 | | 4451 |
| **6** LORENGAU | | | | | 36 | | 658 | | | 38 | | | | | 732 |
| **7** MADANG | 94 | | | | 1800 | 674 | | 27 | | | 6 | 124 | 4136 | | 6861 |
| **8** ORO BAY | | | | | 1009 | | 2 | | | | | | | | 1011 |
| **9** PORT MORESBY | | | | | | | | | | | | | | | |
| **10** RABAUL | | 335 | 1052 | 2346 | 1825 | 270 | 3 | | | | | | | | 5831 |
| **11** SAMARAI | 3 | | | | 12 | | 6 | | | | | | | | 21 |
| **12** VANIMO | | | | | 17 | | 104 | | | 377 | | | | | 498 |
| **13** WEWAK | | | | | 262 | | 4404 | 31 | | | | 371 | | | 5068 |
| TOTAL | 109 | 340 | 1052 | 3077 | 5799 | 992 | 5854 | 662 | | 4929 | 13 | 504 | 4763 | | 28094 |

Source: Freight Study Bureau, Maritime Division, Department of Transport and Civil Aviation.

## TABLE 1.5

## FEEDER/MAIN PORT PASSENGER TRAFFIC - 1982

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM/TO | ALOTAU | KAV. | KIETA | KIMBE | LAELORENGAU | | MADANG | O/BAY | POM | RABAUL | SAMARAI | VAN. | WEWAK | | |
| 1 WESTERN | | | | | | | | | 23 | | | | | | 23 |
| 2 GULF | | | | | | | | | | | | | | | |
| 3 CENTRAL | | | | | | | | | | | | | | | |
| 4 MILNE BAY | 27 | | | | 205 | | 16 | 26 | | 4 | 1 | | | | 279 |
| 5 NORTHERN | | | | | 121 | | | | | | | | | | 121 |
| 6 MOROBE | | | | | 8577 | 7 | 1776 | | | | | | 17 | | 10377 |
| 7 MADANG | | | | | 12 | | 4118 | | | | | | | | 4130 |
| 8 E. SEPIK | | | | | | | 194 | | | | | | | | 194 |
| 9 W. SEPIK | | | | | 7 | | 102 | | | | | | 9 | | 118 |
| 10 MANUS | | | | | | | | | | | | | | | |
| 11 N. IRELAND | | | | | | | | | | 235 | | | | | 235 |
| 12 WEST NEW BRIT. | | | | 100 | 61 | | | | 413 | | | | | | 574 |
| 13 EAST NEW BRIT. | | | | | | | | | | 229 | | | | | 229 |
| 14 N.SOLOMONS | 14 | | 14 | | 1691 | | 1894 | | 2 | 661 | | | 16 | | 4292 |
| TOTAL | 41 | | 14 | 100 | 10674 | 7 | 8100 | 26 | 25 | 1542 | 1 | | 42 | | 20572 |

Source: Freight Study Bureau, Maritime Division, Department of Transport and Civil Aviation.

## TABLE 1.6

## MAIN PORT/FEEDER PASSENGER TRAFFIC 1982

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM/TO: | WEST. | GULF | CENTRAL | M.BAY | NORTHERN | MOROBE | MADANG | E.S. | W.SEP. | MANUS | N.IRE. | W.N.B. | E.N.B. | N.SOLO | |
| 1 ALOTAU | | | | 15 | 3 | | | | | | | | | | 18 |
| 2 KAVIENG | | | | | | | | | | | | | | | |
| 3 KIETA | | | | | | | | | | | | | | 5 | 5 |
| 4 KIMBE | | | | | | | | | | | | 135 | | | 135 |
| 5 LAE | | | | 144 | 153 | 7173 | 44 | | 1 | | | 18 | | | 7533 |
| 6 LORENGAU | | | | | | 10 | | | | | | | | | 10 |
| 7 MADANG | | | | 28 | 2 | 2519 | 3755 | 196 | 81 | | | | | | 6581 |
| 8 ORO BAY | | | | 16 | 15 | | | | | | | | | | 31 |
| 9 P. MORESBY | 1 | 34 | | | | | | | | | | | | | 35 |
| 10 RABAUL | | | | 2 | | | | | | | 217 | 488 | 211 | 246 | 1164 |
| 11 SAMARAI | | | | 2 | | | | | | | | | | | 2 |
| 12 VANIMO | | | | | | | | | 180 | | | | | | 180 |
| 13 WEWAK | | | | | | 13 | | | 27 | | | | | | 40 |
| TOTAL | 1 | 34 | | 207 | 173 | 9715 | 3799 | 196 | 289 | | 217 | 641 | 211 | 251 | 15734 |

Source: Freight Study Bureau, Maritime Division, Department of Transport and Civil Aviation, 1980.

# CHAPTER 2 - FLEETS AND SERVICES

The structure of the coastal fleet and its deployment reflect the trade flows described in Chapter 1 above, although the total pattern is rather complex.

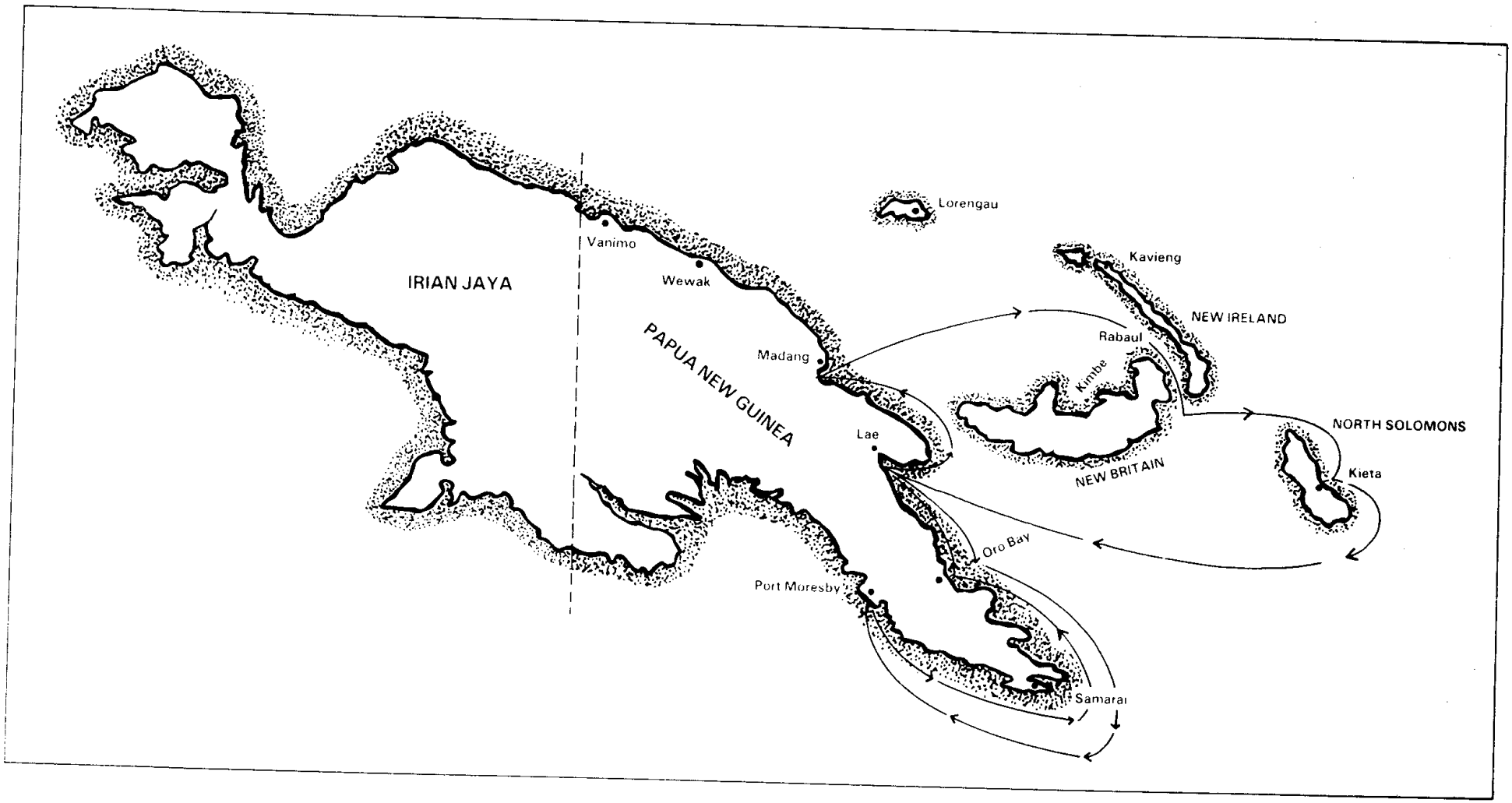
There are two companies which cover the four large ports within the main port system plus others like Alotau and Oro Bay which fit in with them. These are PNG Shipping Corporation and Consort. Lutheran operates along the north New Guinea Coast; Coastal Shipping Services ply to the islands out of Rabaul and Lae and Poroman also operate from Lae to the islands. Finally there is Morehead, a project cargo cum tramp operator based in Lae. In addition to this Burns Philp and Steamships operate the main port-feeder service from Moresby to the Gulf, whilst Burns Philp and Coastal operate the main port-feeder trade out of Rabaul.

**Papua New Guinea Shipping Corporation**

PNGSC is the government line currently operating under a scheme of arrangement with its creditors and managed by New Guinea Australia Line and Swire personnel. It has two ships in the country wide main port trades, the Moresby Chief of some 3,000 dwt and the Provincial Chief of 1,400 dwt. The Company is container oriented and the Moresby Chief will carry some 70 TEUs plus 600 tonnes of break bulk cargo. It cannot presently provide a regular container service because of the relatively much lower container capacity of the Provincial Chief although there are now plans to replace the Provincial Chief with a sister ship to the Moresby Chief.

**PNGSC ITINERARY: Port Moresby, Samarai/Alotau, Oro Bay, Lae, Madang, Rabaul, Kieta, Lae, Port Moresby.**

(2 ships; 21 day round trip; 10½ day service frequency.)




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## TABLE 2.1
## FLEET CHARACTERISTICS (MAIN PORT)

**PNG Shipping Corporation**

| Principal Dimensions (m) | Moresby Chief | Provincial Chief |
|---|---|---|
| L.O.A. | 81.0 | 65.9 |
| Length Registered | | |
| Breadth | 13.2 | 10.6 |
| Draught (Max.) | 5.5 | 6.3 |
| Age (Years) | 10 | 12 |
| **Capacities** | | |
| G.R.T. | 1,599 | 1,085 |
| Total d.w.t. | 3,000 | - |
| Bale cu.m. | 3,760 | 2,287 |
| Containers | 72 x 20' or<br>52 x 20' &<br>60 x 9 cu.m. | 36 x 20' or<br>36 x 20' &<br>9 x 9 cu.m. |
| **Power & Fuel** | | |
| Actual service speed (knots) | 10 | 10 |
| Power b.h.p. | 2,250 | 1,500 |
| Fuel Consumption (t.p.d.) | 6 | 4 |
| **Crew Complement** | | |
| Master (Foreign Going) | 1 | 1 |
| Mate (PNG) | 1 | 1 |
| Engineer Class 1 | 1 | 1 |
| Engineer Class 2 | 1 | 1 |
| Engineer Class 3 | 1 | 1 |
| Coxswain Class 1 | 1 | - |
| Coxswain Class 2 | 1 | 1 |
| Seaman Class 1 (Deck) | 5 | 5 |
| Seaman Class 1 (E/R) | 3 | 2 |
| Catering | 3 | 2 |
| Total Crew | 18 | 14 |

Sailing speed is 10 knots giving a sailing time of 11 days for the distance of some 2,560 n.m. Round trip time is 21 days giving 10 days for cargo handling and port access etc. and the two ships provide a 10 to 11 day frequency, although with the proviso relating to the reduced capacity of the Provincial Chief.

The logic of the itinerary is straightforward. The Lae Moresby sector can encompass, Alotau and Oro Bay with no significant diversion. The heavy discharges are then at Lae and Madang where the ship simultaneously loads for the islands. Moresby, Lae, Madang and intra-island traffic are then carried round the island circuit, the ship returning to Lae to load again for Moresby. In spite of the extended itinerary, transit times will be quite good because the Lae/Moresby and Lae to the islands sectors are all reasonably direct. Only Moresby to the islands and back via Lae and Rabaul-Lae via Kieta are somewhat circuitous. It would however, be difficult for the Moresby, Lae, Madang route to extend up to Wewak and Vanimo, because such an extension for tributory flows would be costly and increase transit times on the islands circuit. Kavieng or Kimbe might be encompassed en route to Rabaul but it would be uneconomic to include both of them in the same round trip.

**Consort Express Line**

Consort Express Line was formed as implied by its name, of a consortium of four parties which joined together in a rationalisation exercise in 1978. The partners are Burns Philp, Lutheran, Anton Lee Transport and Neptunia. The line does not own any ships itself, these are provided by the partners. It operates two ships of 700 cu.m. and one of 1100 cu.m. bale, the latter having a side port. It is break bulk/pallet oriented and none of the ships has any significant container capacity. The company is also in the countrywide main port trades but has a rather different operating strategy from PNG Shipping Corporation. The two smaller ships, (Morobe Coast and the Madang Coast), operate the Moresby - Lae run, calling in at Alotau and Oro Bay in both directions, operating a 14 day round trip and providing a weekly service. Occasionally they extend up the New Guinea Coast to Madang and Wewak. Meanwhile the larger ship (the (New Guinea Coast) runs direct from Moresby to the islands, calling in at Lae on the way if the cargo flow warrants it. Thus there is some specialisation in route patterns between the two lines, Consort having much less capacity on the circuit from Lae around the islands. The two Consort services are shown below:-

| | |
|---|---|
| Moresby & Madang Coast | Moresby, Alotau, Oro Bay, Lae, Madang, and back. |
| New Guinea Coast | Moresby, Kieta, Rabaul, Lae, Moresby. |

## TABLE 2.2
## FLEET CHARACTERISTICS (MAIN PORT)

**Consort Express Line**

| Principal Dimensions (m) | Morobe and Madang Coast | New Guinea Coast |
|---|---|---|
| L.O.A. | 49.7 | 66.6 |
| Length Registered | | |
| Breadth | 8.3 | 10.00 |
| Draught (Max.) | 3.47 | 3.63 |
| Age (Years) | 10 | 21 |
| **Capacities** | | |
| Total d.w.t. | 710 | 1,100 |
| Bale cu.m. | 1,100 | - |
| Containers (TEUs) | - | - |
| **Power & Fuel** | | |
| Speed (Knots) | 9-1/2 | 12-1/2 |
| Power b.h.p. | 500 | 1,200 |
| Fuel Consumption (t.p.d.) (Marine Diesel) | 1.9 tonnes | 4.5 tonnes |
| **Crew Complement** | | |
| *Master PNG Grade 4 | 1 | 1 |
| *Master PNG GRADE 4 (R) | - | 1 |
| *Master Grade 5 | 1 | - |
| *Coxswain Class 2 | - | 1 |
| *Seaman Class 1 | 5 | 6 |
| Engineer Class 1 | - | 1 |
| Engineer Class 3 | 1 | - |
| *Mechanic Class 1 | - | 1 |
| Total Crew | 8 | 11 |

*Available Papua New Guinea

**Coastal Shipping Company**

Coastal Shipping is a privately owned Rabaul based line operating to Lae and the islands. It has four new vessels in the 250 to 300 dwt range which concentrate on main ports, (although including in this some which should be classed as intermediate). The main axis of operation is between Rabaul and Lae, with two of the new ships operating directly along it, and two taking in these ports but operating broader itineraries, the first of which takes in Kavieng and Lorengau, and the second, Kandrian, Kieta and Buka.

There are also four small ships. The first of these cleans up from Rabaul down to Kimbe, whilst another operates to Buka then along the North Solomons coast to Kieta. Finally the two other small vessels serve the New Britain and New Ireland plantation ports.

## FLEET DEPLOYMENT

| SHIP | MAIN TRADING ROUTE |
|---|---|
| 1. "Glomaris" | Rabaul/Bialla/Kimbe/Lae |
| 2. "Beaumaris" | Rabaul/Kimbe/Lae |
| 3. "Cosmaris" | Rabaul/Bialla/Lae |
| 4. "Huris" | Rabaul/Kandrian/Lae/Kieta/Buka |
| 5. "Koris" | Rabaul/Buka/Kieta |
| 6. "Dangit" | Rabaul/Bialla/Lasibu/Kimbe |
| 7. "St. George" | Rabaul/New Ireland/ New Britain Feeder |
| 8. "Yampi Lass" | Rabaul/New Ireland/ New Britain Feeder ports. |

## TABLE 2.3
## FLEET CHARACTERISTICS (MAIN PORT & FEEDER)

**Coastal Shipping Company**

| Principal Dimensions (m) | Glomaris | Beaumaris | Cosmaris | Huris |
|---|---|---|---|---|
| L.O.A. | 39.5 | 37.5 | 37.5 | 34.4 |
| Breadth | 9.2 | 8.6 | 8.6 | 8.2 |
| Depth | 3.0 | 4.2 | 4.2 | 3.5 |
| Age (Years) | 2 | 2 3 | 4 | |
| **Capacities** | | | | |
| G.R.T. | 372 | 353 | 340 | 354 |
| Total d.w.t. | 300 | 280 | 280 | 250 |
| Bale cu.m. | 600 | 550 | 550 | 480 |
| **Power & Fuel** | | | | |
| Speed (Knots) | 10.5 | 11 | 11 | 11.5 |
| Power b.h.p. | 2 x 365 | 2 x 365 | 2 x 365 | 2 x 365 |
| Fuel Consumption (t.p.d.) | 3 | 3 | 3 | 3 |
| **Crew Complement** | | | | |
| *Master PNG (National) | 1 | 1 | 1 | 1 |
| Chief Officer (National) | 1 | 1 | 1 | 1 |
| Chief Engineer (Expat.) | - | 1 | - | 1 |
| Chief Officer (National) | 1 | 1 | 1 | 1 |
| Engine Hands | 2 | 2 | 2 | 2 |
| Seamen | 5 | 5 | 5 | 5 |
| Supervisor - Cargo | 1 | 1 | 1 | 1 |
| Cook | 1 | 1 | 1 | 1 |
| Total Crew | 12 | 12 | 12 | 12 |

## TABLE 2.3 (CONTD.)
## FLEET CHARACTERISTICS

**Coastal Shipping Company (Contd.)**

Principal Dimensions (m)

| | Karis | Dangit | St. George | Yampi Lass* |
|---|---|---|---|---|
| L.O.A. | 29.7 | 24.0 | 24.0 | 24.5 |
| Breadth | 7.0 | 6.4 | 6.4 | 6.2 |
| Depth | 2.0 | 2.0 | 2.0 | - |
| Age (Years) | 6 | 10 | 11 | 37 |
| **Capacities** | | | | |
| G.R.T. | 203 | 121 | 124 | 305 |
| Total d.w.t. | 160 | 110 | 110 | 80 |
| Bale cu.m. | 220 | 160 | 160 | 140 |
| **Power & Fuel** | | | | |
| Speed (Knots) | 9 | 8 | 8 | 7.5 |
| Power b.h.p. | 2 x 190 | 2 x 165 | 2 x 165 | 1 x 200 |
| Fuel Consumption(t.p.d.) | 1.6 | 1.6 | 1.6 | 1 |
| **Crew Complement** | | | | |
| Master (National) | 1 | 1 | 1 | 1 |
| Chief Officer (National) | 1 | 1 | 1 | 1 |
| Chief Engineer (Expat.) | 1 | 1 | 1 | 1 |
| Engine Hand | 2 | 3 | 2 | 2 |
| Seamen | 5 | 7 | 7 | 7 |
| Supervisor - Cargo | 1 | 1 | 1 | 1 |
| Cook | 1 | 1 | 1 | 1 |
| Total Crew | 12 | 15 | 14 | 14 |

* To be retired.

**Lutheran Shipping**

Lutheran is a Madang based company, which as already mentioned has a 25% share in Consort. In its own operation along the north New Guinea coast it has seven ships. Five are of 320 cu.m. bale, three of them having 100 and the other 130 passenger capacity. The other two ships are much smaller with only 92 cu.m. bale. The vessels are deployed on a set of itineraries covering the New Guinea coast with some limited services to the islands. Itineraries are as follows:

1. Vanimo - Oro Bay. Two ships on a 14 day round trip providing a weekly service.

2. Lae-Wewak-Madang. One ship on a weekly round trip.

3. Lae-Madang weekly, Manus fortnightly. One extra fortnightly to Wewak if required. (1 ship)

4. Madang-Lae-Tufi-Dogura-Alotau-Samurai. One ship on a 14 day round trip plus occasional calls to Wewak if required.

The two smaller vessels serve plantation ports.

## TABLE 2.4
## FLEET CHARACTERISTICS (MAIN PORT & FEEDER)

**Lutheran Shipping**

| Principal Dimensions (m) | Five Ships | Two Ships |
|---|---|---|
| L.O.A. | 29.9 | 20.0 |
| Breadth | 7.5 | 5.8 |
| Draught | 2.6 | 2.0 |
| Age (Years) | 1-5 | |
| **Capacities** | | |
| Bale cu.m. | 320 | 92 |
| Passengers | 100/130 | |
| **Power & Fuel** | | |
| Speed (Knots) | 10 | 9.5 |
| b.h.p. | 172 x 2 | 172 x 1 |
| Fuel Consumption (t.p.d.) | 1.5 | 0.75 |
| **Crew** | | |
| Coxswain Class 1/Master Class 5 | 1 | 1 |
| Coxswain Class 3 | 1 | 1 |
| Engineer Class 4/5 | 1 | 1 |
| Engineer Mechanic | 1 | 1 |
| Seamen | 4 | 4 |
| Total Crew | 8 | 8 |

**Burns Philp (PNG) Ltd.**

Burns Philp have four new "Bur" class ships operating in the main port/feeder trades, two based on Rabaul and two on Port Moresby. It also has three smaller ships which have operated in the Gulf trade, for the last ten years.

Taking the two Rabaul based ships, one provides an 8 day service to Buka, and the plantation ports on North Solomons down to Kieta, whilst the second serves the New Ireland east coast and the south coast of New Britain fortnightly, and also the north coast of New Britain monthly. These ships serve the Burns Philp plantations as well as the other small centres along their route. They are not licensed to call at Lae.

The "Bur" class ships distribute diesel fuel, from 27,000 litre capacity tanks and this eliminates all stevedoring costs, plus the cost of drums. They also have a large cold store. Finally they have two four tonne derricks, which can twin to handle containers of 9 cu. m.

Burns Philp also have three older ships operating from Port Moresby to the Gulf and the West although these are apparently nearing the end of their lives.

## TABLE 2.5
## FLEET CHARACTERISTICS (FEEDER)

**Burns Philp (PNG) Ltd.**

| | "Bur" Class 4 ships |
|---|---|
| Principal Dimensions (m) | |
| L.O.A. | 37.5 |
| Length Registered | - |
| Breadth | 9.0 |
| Draught (Max.) | 3.03 |
| Age (Years) | 2 |
| Capacities | |
| G.R.T. | 226 |
| Total d.w.t. | 370 |
| Bale cu.m. | 500 |
| Containers (TEUs) | - |
| Power and Fuel | |
| Speed (Knots) | 8 |
| Power b.h.p. | 600 |
| Fuel Consumption (t.p.d.) | 1.9 |
| Crew Complement | |
| Master PNG Grade 4 (R) | 1 |
| Coxswain Class 2 | 1 |
| Seaman 1 | 5 |
| Engineer Class 3 | 1 |
| Total Crew* | 8 |

*Plus 4 for stevedoring duties in the Rabaul area.

**Steamships Trading Company Ltd.**

The Steamships Trading Company concentrates its shipping activities on services to the Papuan Gulf and the West. It has one conventional ship and four landing craft barges on regular freight services, plus a fleet of tugs and dumb barges and one landing craft barge, providing services to the Ok Tedi project, plus a dedicated timber operation.

## TABLE 2.6
## FLEET CHARACTERISTICS (GENERAL CARGO SERVICES)

**Steamships Trading Company Ltd.**

| NAME | TYPE | GRT |
|---|---|---|
| Hiri Chief | Conventional | 614.00 |
| Erima Chief | LC Barge | 262.99 |
| Moale Chief | LC Barge | 262.99 |
| Agutoi Chief | LC Barge | 262.99 |
| Motuan Chief | LC Barge | 343.24 |

### OK TEDI SERVICES & SERVICES TO A DEDICATED TIMBER OPERATION

| | | |
|---|---|---|
| Bernard Frank | LC Barge | 135.60 |
| Ok Tarim | Tug | 118.00 |
| Ok Menga | Tug | 118.00 |
| Kapari | Tug | 27.61 |
| Union 52 | Dumb Barge | 656.84 |
| Union 55 | Dumb Barge | 656.84 |
| Steel Seafarer | Dumb Fuel Barge | 503.00 |
| Steel Ranger | Dumb Fuel Barge | 330.00 |
| Steel Navigator | Dumb Fuel Barge | 670.00 |
| Steel Explorer | Dumb Fuel Barge | 670.00 |
| Steel Voyager | Dumb Fuel Barge | 670.00 |
| Steel Mariner | Dumb Fuel Barge | 670.00 |

This fleet provides the following services:-

a. weekly service Port Moresby/Kiunga with Hiri Chief and Motuan Chief backed up on occasions by Moale Chief.

b. weekly service to Gulf ports, principally Kerema, Ihu, Baimuru with Erima Chief and Moale Chief.

c. fortnightly service to East Papua ports, Samarai, Abau, Kupiano, Milport Harbour, Gamadoudou, Magarida with Agutoi Chief.

**Pacific New Guinea Line**

Pacific New Guinea Line has a pure passenger operation based on Rabaul. Basic details of the three ships are presented below.

TABLE 2.7
FLEET CHARACTERISTICS

| | Kaum | Kazi | Kris |
|---|---|---|---|
| L.O.A. (m) | 22 | 28 | 36 |
| Passengers | 70 | 100 | 125 |
| Age (Years) | 18 | 16 | 20 |

There are two services - the Kazi operating from Rabaul to Bialla, Kimbe and Lae, and the Kris on the route to Buka and Kieta, taking in all plantation ports. The Kazi has 147 cu.m. of freight capacity. It used to carry freight on the North Solomons run but the licence was rescinded. Recently there has also been a move to rescind the passenger licence, but this was resisted in the courts.

**Poroman Shipping**

Poroman Shipping is a Madang based line which has recently been given a licence to run the Doilan on main port trades. This is an old water carrier of about 400 cu.m. bale which has been converted. The vessel is now working for South Pacific Brewery carrying beer from Lae around the islands chiefly to Rabaul and Kieta.

**Morehead Shipping**

Mention may finally be made in this section of Morehead a company based in Lae which concentrates on project cargoes with occasional incursions into the mainport trades. The line has four landing craft type ships, plus three coastal tankers, two of which are chartered to Shell.

**Comment on Fleets and Service Structures**

If one now reviews the overall fleet and service structure from a national point of view it is clear that there are differences with respect to choice of technology, i.e. containers versus conventional and pallet handling. There are also important differences in operating strategy and ship size. Many general cargo routes in the world show a great deal of diversity, but it can well be argued that in Papua New Guinea the system is too small to sustain a number of conflicting approaches. There seem to be two key issues which will be explored in further detail in Chapter 3 below. The first of these is the choice of handling technology and the second and related issue concerns size economies and operating strategy. The basic question is how much of the country can be brought within the compass of relatively large ships of 2,000 cubic metres or so capacity, operating efficiently on a multi-port network. This is important because these large ships, if they could be deployed efficiently, would have much lower costs per tonne of cargo than small vessels.

## TABLE 2.8

## SCHEDULE OF MAIN PORT DISTANCES (NAUTICAL MILES) AND DISTANCE CODES

| PORTS | ABBREV. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AITAPE/VANIMO | (AIT) | 0 | 4 | 3 | 5 | 3 | 2 | 2 | 1 | 2 | 5 | 3 | 1 |
| ALOTAU/SAMARAI | (ALO) | 796 | 0 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 1 | 2 | 3 |
| KAVIENG | (KAV) | 587 | 603 | 0 | 2 | 1 | 2 | 1 | 1 | 2 | 4 | 1 | 2 |
| KIETA | (KIE) | 1038 | 480 | 423 | 0 | 2 | 3 | 4 | 3 | 3 | 3 | 1 | 4 |
| KIMBE | (KIM) | 584 | 552 | 186 | 454 | 0 | 1 | 1 | 1 | 2 | 4 | 1 | 2 |
| LAE | (LAE) | 527 | 341 | 376 | 696 | 293 | 0 | 2 | 1 | 1 | 3 | 2 | 2 |
| LORENGAU | (LOR) | 369 | 702 | 230 | 865 | 297 | 364 | 0 | 1 | 2 | 4 | 1 | 1 |
| MADANG | (MAG) | 332 | 556 | 341 | 716 | 303 | 220 | 234 | 0 | 1 | 4 | 2 | 1 |
| ORO BAY | (OR) | 532 | 228 | 461 | 641 | 388 | 189 | 465 | 317 | 0 | 2 | 2 | 2 |
| PORT MORESBY | (POM) | 1049 | 253 | 856 | 722 | 805 | 594 | 949 | 803 | 450 | 0 | 3 | 4 |
| RABAUL | (RAB) | 688 | 477 | 166 | 272 | 182 | 422 | 348 | 406 | 451 | 694 | 0 | 2 |
| WEWAK | (WWK) | 150 | 646 | 437 | 885 | 434 | 377 | 254 | 182 | 382 | 899 | 538 | 0 |
| | | AIT | ALO | KAV | KIE | KIM | LAE | LOR | MAG | ORO | POM | RAB | WWK |

Source: Papua New Guinea Shipping Association, Freight Calculator, February 1983

# CHAPTER 3 - COMMENTARY ON COASTAL SERVICES

## 1. MAIN PORT FREIGHT SERVICES

### Choice of Ships and Cargo Handling Systems

The technology in use on the coast is largely conventional, although this includes the quite efficient pallet operations which were widespread in Papua New Guinea's international trades prior to recent containerisation of some of the major routes. There has, however, been a recent move towards containerisation of the main port coastal trades by the Shipping Corporation, which received unfavourable comment in the recent ESCAP report. At the time that the ESCAP report was produced the Shipping Corporation was in receivership, so something had obviously been wrong with its operations and management, but the criticism of containers as a concept for the major flows on the coast cannot stand on this basis.

In recent years the pallet system as operated by Consort has performed well on the coast as shown by the fact that the line was able to achieve viability even on an overtonnaged route on the freight rates applying in 1982. Further, a number of low cost elements can be identified within the operation. The two smaller Consort ships, the Morobe Coast and Madang Coast, have crews with a very high local content and fuel consumption of only 1.9 tonnes per day, whilst maintenance costs are held down by the fact that they may be dry docked locally. Further to this, even FCL container handling offers only moderate savings over shrink wrapped pallet handling in Papua New Guinea, although this is not because the pallet handling is particularly cheap, but because container handling at Harbours Board wharves is relatively expensive. A further point is that a considerable proportion of coastal cargo is transhipped on to the smaller feeder vessels which do not have a container capability, whilst many small receivers also require less than container loads. Finally, the labour saving property of containers may create problems in a country where employment is scarce, whilst the container system also requires very good management in order to be efficient. However, accepting all of these arguments it still seems likely that

there will be a substantial increase in container penetration in the coastal trade. The case for this is made below. It depends partly on arguing from first principles that modern multi-purpose ships will carry containers at least as efficiently as the existing ships will carry pallets. But this is not the whole case. The basic point is that in modern multi-purpose ships palletised cargoes may be carried efficiently as well as containers, so that for the medium term the whole problem tends to disappear. Indeed it becomes almost unthinkable that in a trade where there is evident demand from shippers and receivers for containers, new ships would be brought onto the route without a container capacity. The problem is not one of choice of technology, it is of the transition to a multi-purpose capability which will encompass both the competing technologies.

**The Evolution of Ship Design and Development of Multi-Purpose Vessels**

Although the container revolution was accomplished largely with specialised ships which concentrated on the carriage of containers only, it also set in train an evolution in the design of conventional ships, including tramps, liners and small coasters. Conventional ships of the type built in large numbers in the 1950's and 1960's for break bulk and pallet handling are very poor container carriers. In fact in the older traditional designs container capacity is so poor that if all cargo had to be stowed in containers the ship would lose between 60% and 80% of its carrying capacity. This problem can, however, be largely overcome by appropriate design. There are two elements to this, first the re-design of the cargo holds and hatches to avoid wastage of space and maximise the number of containers accommodated, and second, the provision of a substantial capacity on the weather deck. Even in a ship designed specifically for containers there is always a certain space loss in the holds (compared to a conventional stow) because the containers themselves take up a considerable amount of it and there is also a certain amount of unused space between them. However, in ships of modern design this loss is recovered by carrying containers on deck. There is of course more to it than this, as the whole ship has to be re-designed to ensure that there is adequate stability to sustain cargo stowed relatively high up on the weather deck, but this problem has now been solved. As a

result of this design process modern multi-purpose ships may now provide at least as much cargo space in a full container stow as conventional ships of the same size provide in a break-bulk stow. (This point is demonstrated in Table 3.1, which provides details of a number of designs for small ships.) Where break-bulk cargo below deck is combined with containers carried on deck, the space available for cargo is increased even further. As a result of this these modern ships can move cargo at least as cheaply in terms of cost per tonne mile at sea as ships of conventional design. A further point is that the provision of this high container capacity does not necessarily lead to any sacrifice of conventional capacity. This is particularly so in small ships, because they stow only two containers high below the weather deck so that the cell guides, which would interfere with a break-bulk stow, are not really required. Thus they can be operated as conventional ships, either with one 18' hold, or with a tween deck giving two 9' holds ideal for pallet operations.

So far the multi-purpose coaster has been considered only in terms of its ability to provide equivalent capacity and costs per tonne mile at sea to conventional ships. However, the use of containers allows for much faster cargo handling, reducing ship time in port and allowing larger more economical ships to be used. In Papua New Guinea for example, ships some two or three times the size of the present pallet ships could operate the same itineraries with no increase in ship speed.

It is one of the strange features of the container revolution that although the cellular ship was developed very early on (in fact before containers were even introduced to the deep sea trades in 1967) and was highly evolved by 1972, this was not the case with multi-purpose designs. Both in general cargo tramps and liners and in coasters, there was a process of design evolution which did not start until the late 1960's and then took the best part of the fifteen years to the present day to reach the point at which containers could be carried with high efficiency. Indeed in certain respects this process of development is still going on today, particularly in the case of the smaller vessels. Some of the intermediate designs have relatively low container capacities in relation to their size, and correspondingly higher operating costs per unit of container capacity when approaching a full cargo of containers.

There is one further limitation which applies to small container carrying ships, which is that many of those employed in the trades of the developed world are feeder containerships which rely on shore based cranes. Thus they do not carry their own cargo handling gear and they may not have the dimensions, particularly the beam required, to remain stable whilst supporting heavy loads over the side of the ship. Small containerships may be designed with a self-sustaining capability, certainly down to about 70 TEUs, but there may not be too many presently available for the charter market.

The Moresby Chief, as a ten year old ship, is an intermediate design, although with a fair container capacity. Meanwhile the Consort ships were designed for pallet operations and carrying steel products and have virtually no container capacity at all. The same applies to the smaller main port-feeder ships, although some are fairly new. However, these small ships carry tributary flows, and are somewhat below the size at which a self-sustaining container lo-lo capability is feasible, whilst the shippers they service often require very small consignments. The Moresby Chief has much higher daily costs than the two smaller Consort vessels, but she is also some three times bigger in terms of space and this compensates for the high daily rate.

## TABLE 3.1
## A SELECTION OF STANDARD SHIP DESIGNS

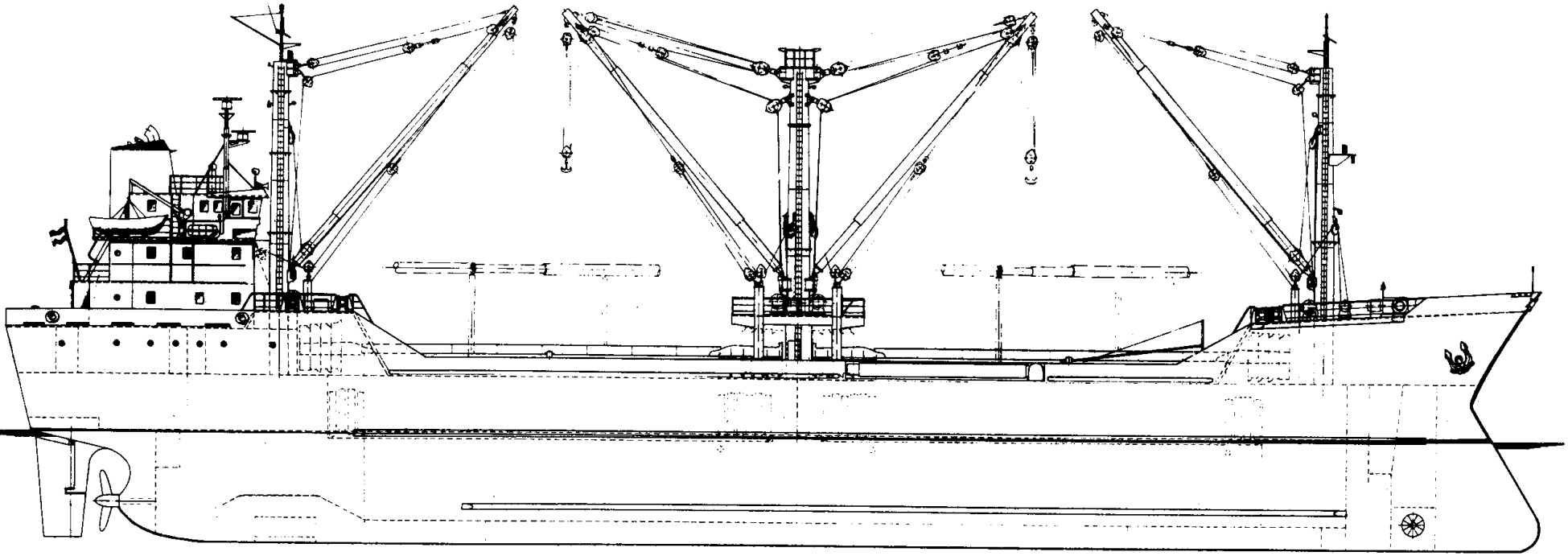
| | AMELS | ASTILLEROS CADEQUA | CLELANDS TYPE 42 | MARTIN JANSEN 95T | MARTIN JANSEN 99T | MAZAGON DOCK | NITCHITSA | SIETAS TYPE 105 | BRITISH SHIPBUILDERS |
|---|---|---|---|---|---|---|---|---|---|
| Principal Dimensions (m) | | | | | | | | | |
| L.O.A. | 82.8 | 103.5 | 90.5 | 100.3 | 79.6 | 97.2 | 86.5 | 84.3 | 70.0 |
| Breadth | 16.0 | 14.5 | 14.2 | 14.0 | 13.5 | 14.7 | 13.0 | 13.8 | 14.0 |
| Draught | 5.8 | 6.6 | 6.0 | 6.1 | 5.5 | 5.5 | 4.8 | 5.1 | 5.0 |
| Capacities | | | | | | | | | |
| GRT 1599 | - | 1599 | - | 1600 | 1598 | 999 | 499 | - | |
| Bale (cu.m.) | 5800 | 5995 | 5510 | 5915 | 3350 | 4960 | - | 3455 | 3200 |
| Containers TEUs[a] | 144 | 124 | 138 | 150 | 88 | 128 | 140 | 124 | 102 |
| Bale in Containers | 4824 | 4154 | 4623 | 5025 | 2948 | 4288 | 4696 | 4154 | 3438 |
| % of Break Bulk Bale | 83 | 70 | 84 | 85 | 88 | 86 | 107 | 120 | 107 |
| Total DWT | 3650 | - | 4200 | 4470 | 3025 | 3754 | 2400 | 1900 | 1900 |
| DWT in containers[b] | 2880 | 2480 | 2740 | 3000 | 1760 | 2560 | 2800 | 2480 | 2014 |
| % of Total DWT | 79 | - | 65 | 67 | 58 | 68 | 107 | 130 | 106 |
| Berths | 12 | 22 | 15 | - | 12 | 18 | 12 | - | - |
| Speed & Fuel Consumption | | | | | | | | | |
| Speed | 13 | 15 | 13 | 14 | 12 | 13 | 14 | 12 | 11 |
| b.h.p. | 3000 | 4000 | 2790 | 2900 | 1980 | 3180 | 2100 | 1500 | 1500 |
| Consumption t/day | 11 | 13.8 | 9.5 | - | - | - | - | - | 5.1 |
| Cargo Handling Gear (t) | | | | | | | | | |
| C = Cranes, D = Derricks | 4 x 8 | 2 x 10 | 1 x 20 | 2 x 20 | 2 x 5 | 2 x 12.5 | Gearless | N/A | 1 x 20 |
| 1 x 25 | 2 x 20 | 2 x 5 | 2 x 5 | 1 x 20 | 1 x 10 | - | - | 1 x 20 | |
| | | | | 1 X 15 | | | | | |
| D | C | C | C | D | C | | N/A | C | |

a. 8' x 8' 6" x 20'
b. Taken at 20 tonnes per 20' box

Source: Fairplay Standard Ship Designs, Volume 2, 1980. British Shipbuilders.

# Design: 75m Dutch Diploma Law Freedeckship

**Amels, C.**



**DIMENSIONS & TONNAGES**

*G.R.T:* 1599
*D.W.T:* 3650
*L.O.A:* 82.8m (271' 8")
*L.B.P:* 74.0m (242' 9")
*BREADTH:* 16.0m (52' 6")
*DEPTH:* 8.9m (29' 2")
*DRAFT:* 5.8m (19' 0")

**MACHINERY DETAILS**

*MAKE:* MaK
*TYPE:* 8Mu 453AK
*ENG. BLDR:*
*OUTPUT:* 3000 bhp @ 600 rpm
*CAPACITY:* 230t
*CONSUMPTION:* 11t/day
*RANGE:* 6500 miles
*GENERATORS:* 4 x 125 kW
*SPEED:* 13

**CARGO DETAILS**

*GRAIN:* 6685cu.m. (236080cu.ft.)
*BALE:* 5800cu.m. (204827cu.ft.)
*REFRIG:*
*CONTAINERS:* 144
*NO. OF HOLDS:* 2
*NO. OF HATCHES:* 2

*CARGO GEAR:* 4 Derricks - 8t
1 Derrick - 25t

*HATCH DIM:*
(1)(2) 18.85m x 13.0m (61' 10" x 42' 8")

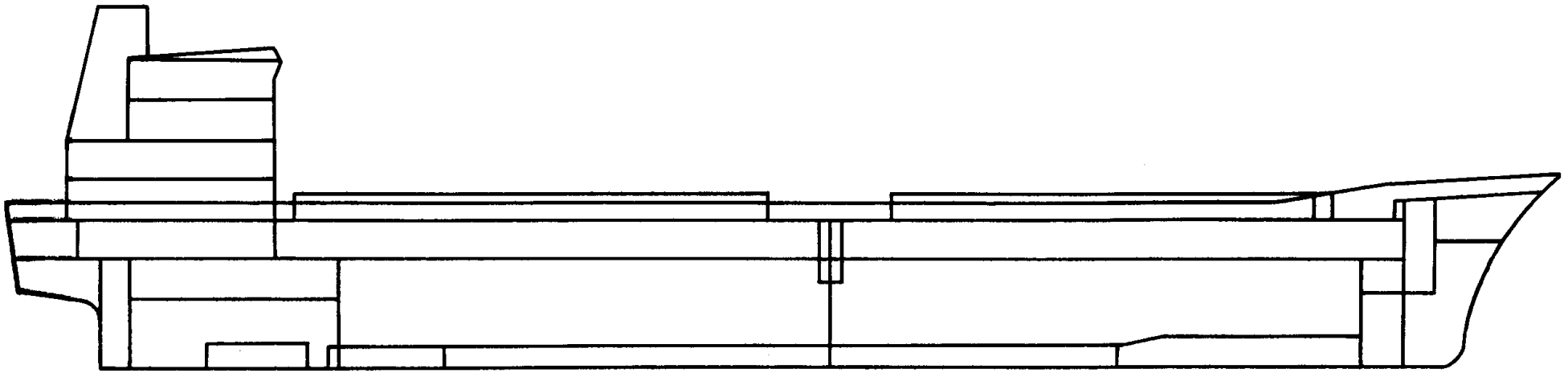
**OTHER DETAILS**

*COMPLEMENT:* 12
*CLASSIFICATION:* BV

**REMARKS**

*Engine output is restricted to 2500 bhp. 84 containers may be stowed in the holds - 60 on deck. Conforms to St. Lawrence Seaway Regulations. Controllable Pitch Propeller optional. Ice Strengthening optional. This design is described as a freedecker-closed loadline optional.*

**Design: Type 42** **Clelands Shipbuilding Co. Ltd**



**DIMENSIONS & TONNAGES**

*G.R.T:* 1599
*D.W.T:* 4200
*L.O.A:* 90.5m (296' 11")
*L.B.P:* 83.2m (273' 0")
*BREADTH:* 14.2m (46' 7")
*DEPTH:* 8.6m (28' 3")
*DRAFT:* 6.0m (19' 8")

**MACHINERY DETAILS**

*MAKE:* Burmeister & Wain (Alpha)
*TYPE:* 18V23LVO
*ENG. BLDR:*
*OUTPUT:* 2790 bhp @ 825 rpm
*CAPACITY:* 250t
*CONSUMPTION:* 9.5t/day
*RANGE:*
*GENERATORS:* 2x108 kW, 1x192 kW
*SPEED:* 13 (Shaft)

**CARGO DETAILS**

*GRAIN:* 5940cu.m. (209771cu.ft.)
*BALE:* 5510cu.m. (194586cu.ft.)
*REFRIG:*
*CONTAINERS:* 138
*NO. OF HOLDS:* 2
*NO. OF HATCHES:* 2

*CARGO GEAR:* 1 Leibherr Crane-20t
2 Leibherr Cranes-5t

*HATCH DIM:*
(1)(2) 25.0m x 10.15m (82' 0" x 33' 4")

**OTHER DETAILS**

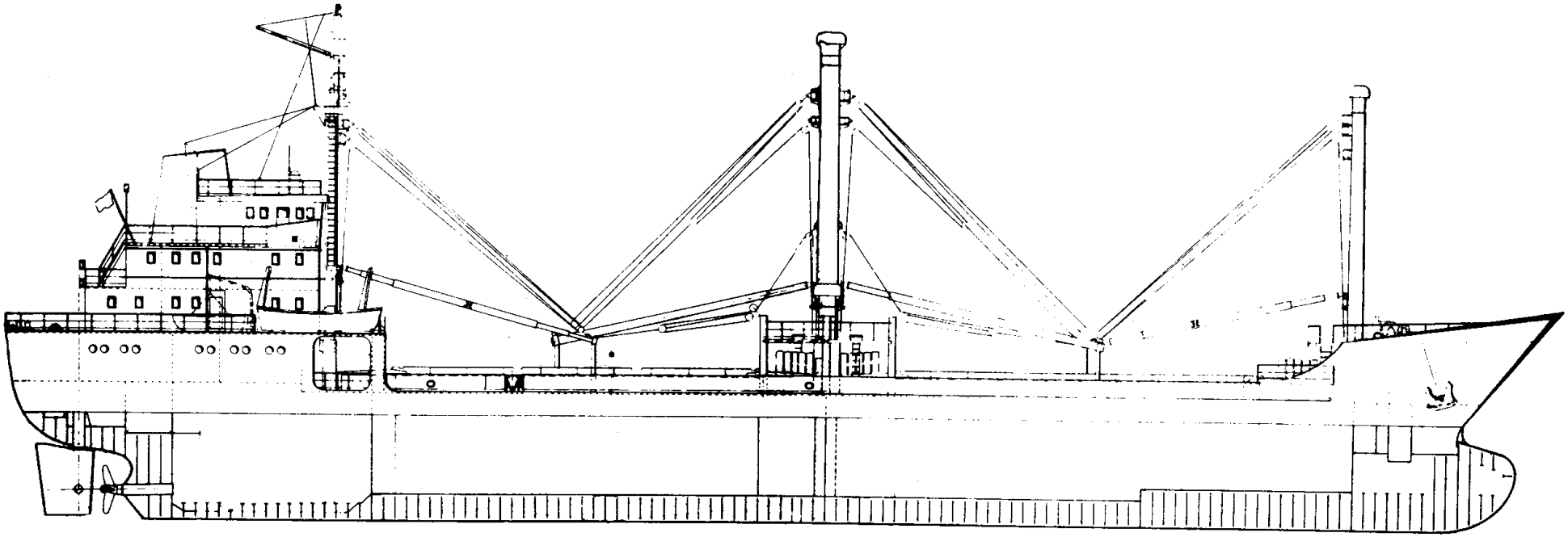
*COMPLEMENT:* 15
*CLASSIFICATION:* LR

**REMARKS**

*Ice Class 3.*
*Unmanned Machinery Space Classification.*
*Controllable Pitch Propeller.*

# Design: 99T

## Jansen, Martin





**DIMENSIONS & TONNAGES**

*G.R.T:* 1600
*D.W.T:* 3025
*L.O.A:* 79.6m (261' 2")
*L.B.P:* 71.0m (232' 11")
*BREADTH:* 13.5m (44' 4")
*DEPTH:* 6.7m (22' 0")
*DRAFT:* 5.5m (18' 1")

**MACHINERY DETAILS**

*MAKE:* Deutz
*TYPE:* RBV 8M540
*ENG. BLDR:*
*OUTPUT:* 1980 bhp @ 262 rpm
*CAPACITY:* 272t
*CONSUMPTION:*
*RANGE:*
*GENERATORS:* 3x175 kVa, 1x43 kVa
*SPEED:* 12

**CARGO DETAILS**

*GRAIN:* 3641cu.m. (128653cu.ft.)
*BALE:* 3350cu.m. (118376cu.ft.)
*REFRIG:*
*CONTAINERS:* 88
*NO. OF HOLDS:* 2
*NO. OF HATCHES:* 2

*CARGO GEAR:* 2 derricks - 5t
1 derrick - 20t
1 derrick - 15t

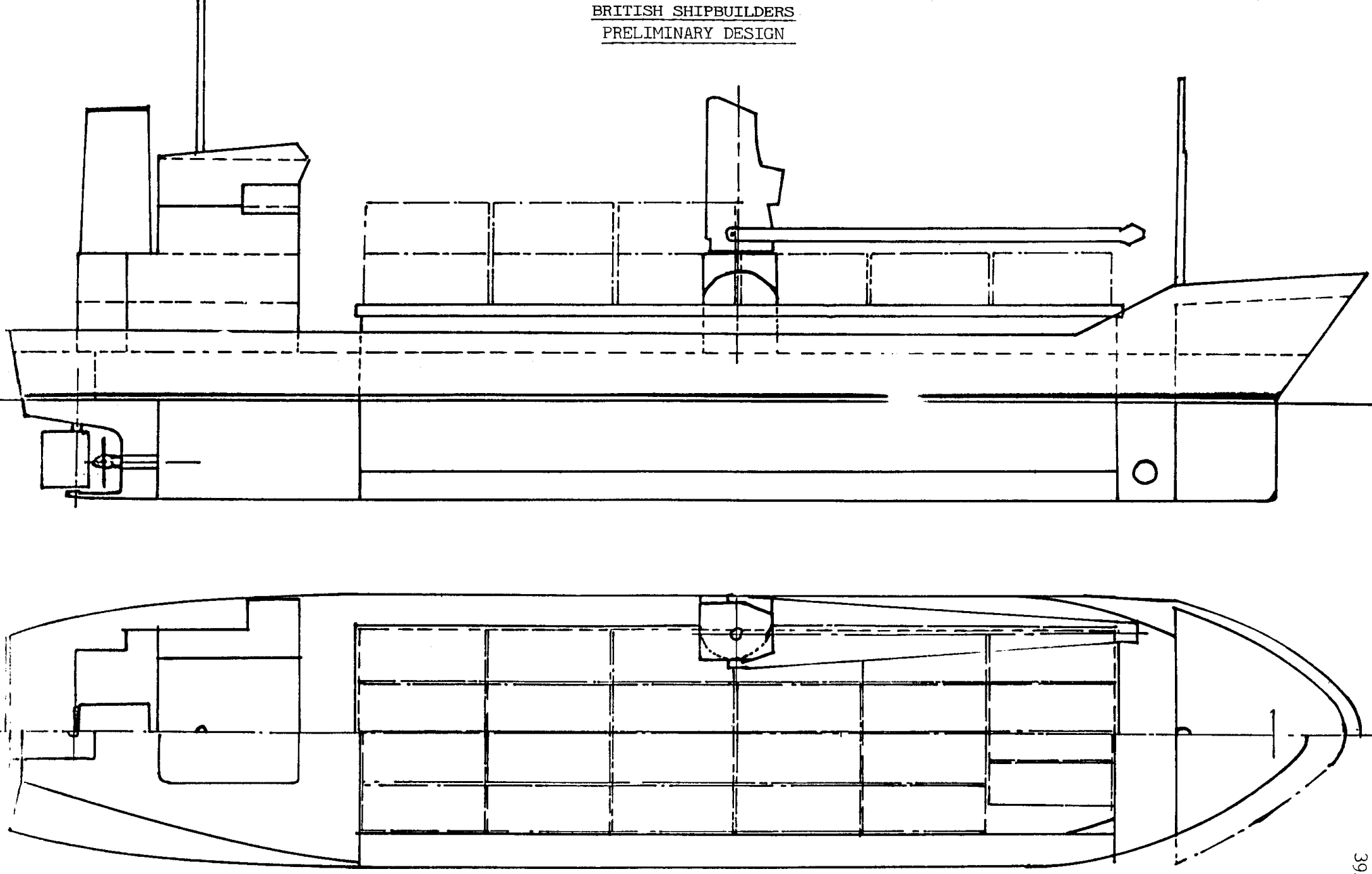
*HATCH DIM:*
(1)(2) 18.6m x 10.3m (61' 1"x33' 10")

**OTHER DETAILS**

*COMPLEMENT:*
*CLASSIFICATION:* GL

**REMARKS**

BRITISH SHIPBUILDERS
PRELIMINARY DESIGN



Coming back to the main theme of the argument, the availability of multi-purpose designs means that in the long run there is no great problem with choice of technology as ships will be available which will carry containers, conventional and palletised cargoes with a great deal of flexibility and efficiency. These vessels will eventually provide a more economic option than any of the vessels in the current fleet, they would be very much larger than the present Consort vessels and they would also have a better ratio of capacity to operating costs than the Moresby Chief type. For the present, however, there may be a problem which is that ships of precisely the right type of modern design for the coastal trade may not be readily available on the charter market. They could, of course, be obtained by building new vessels, but this is relatively expensive. Thus there is undoubtedly a problem of transition, which arises partly as a result of commitments to existing tonnage and partly because a switch to modern designs might also involve a switch to brand new vessels.

Table 3.2 below gives a comparison of three ships of the type discussed above, a small general cargo/pallet ship, an intermediate multi-purpose containership ten years old and a newly built multi-purpose containership. One of the small L.C. barges of the type popular on the coast is also included for comparison. Although an attempt has been made to ensure that the figures are reasonably well related to those which apply on the coast, they must be treated with some caution because they have been standardised and do not precisely represent the experience of individual companies. Nevertheless, certain broad conclusions emerge. First, although the intermediate containership is more expensive in daily costs than the small pallet ship, it is also very much larger and costs per capacity mile at sea are comparable. Certain assumptions have had to be made about the new ship but if it could be obtained for K2m. it would appear to be competitive even now. Finally, the large ships of the main port trade do seem to be very much cheaper to operate in terms of costs at sea than the small landing craft barges used in the main port feeder trades.

## TABLE 3.2
## A COMPARISON OF SHIP COSTS AT SEA

| SHIP TYPE | MODERN MULTI-PURPOSE | INTERMEDIATE MULTI-PURPOSE | SMALL G.C. | SMALL MAIN PORT/FEEDER |
|---|---|---|---|---|
| Dimensions (m) | | | | |
| L.O.A. | 70.0 | 81.0 | 49.7 | 37.0 |
| Breadth | 14.0 | 13.2 | 8.3 | 9.0 |
| Draught | 5.0 | 5.5 | 3.5 | 3.0 |
| Capacities | | | | |
| Bale cu.m. | 3200 | 3,760 | 1,100 | 500 |
| Total Dwt | 1900 | 3,000 | 700 | 370 |
| TEUs | 102 | 70 | - | - |
| Power & Fuel | | | | |
| Speed (Knots) | 11 | 10 | 9-1/2 | 8 |
| Power b.h.p. | 1500 | 2,250 | 500 | 600 |
| t.p.d. | 5.1 | 6.0 | 1.9 | 1.9 |
| SHIP COST (K/DAY) | | | | |
| Capital cost/charter rate | 1000[a] | 800 | 300 | 360[b] |
| Crew Cost | 600 | 780 | 200 | 200 |
| R & M | | 426 | 300 | |
| Insurance | 600 | 63 | 37 | 450 |
| Other | | 126 | 50 | |
| Total in Port | 2200 | 2,195 | 887 | 1011 |
| Fuel at Sea (gas oil K350 per tonne) | 1785 | 2,100 | 690 | 690 |
| Cost 3,300 cu.m. bale miles or100 TEU miles | 15.1 | 19.9[c] | 20.7 | 58.5 |

a. K2m discounted at 12% over ten years.
b. K700,000 discounted at 12% over ten years.
c. 70 TEUs plus 600 cu.m.

## TABLE 3.3 - AN F.E.L TRUCK TERMINAL FOR SELF SUSTAINING SHIPS (THROUGHPUT 20,000 TEUs. COSTS IN KINA)

| | No. | Unit Cost | Total Capital | Life Years | Annual Capital Cost[a] | Maintenance % | Annual Maintenance | Total Annual Cost |
|---|---|---|---|---|---|---|---|---|
| Equipment | | | | | | | | |
| FEL trucks | (4) | 200,000 | 800,000 | 7 | 175,300 | 15 | 120,000 | 295,300 |
| Fixed Capital | | | | | | | | |
| Quay Wall | 180 m. | 20,000/m. | 1,800,000 | 25 | 229,499 | 1 | 18,000 | 336,571 |
| Park | 1.95 h.a. | 30 sq.m. | 585,000 | 10 | 103,535 | 5 | 29,251 | 132,785 |
| Total Fixed Capital | | | 2,385,000 | | 333,034 | | 47,251 | 380,285 |
| Total Fixed Capital & Equipment | | | 3,185,000 | | 508,334 | | 167,251 | 675,585 |

N.B. Throughput for 15,000 loaded TEUs at 15 tonnes per box 225,000 tonnes. Capital and equipment cost K3.0 per tonne.
A 12% discount rate is used throughout.
Excludes site dependent costs, sea and land access and land reclamation.

Source Derived from Container Logistics and Terminal Design.

## TABLE 3.4 - A SMALL SHIP CONVENTIONAL BERTH (THROUGHPUT IN TONNES, COSTS IN KINA)

| | No. | Unit Cost | Total Capital | Life Years | Annual Capital Cost | Maintenance % | Annual Maintenance | Total Annual Cost |
|---|---|---|---|---|---|---|---|---|
| Equipment | | | | | | | | |
| 4 Tonne Forks | 8 | 17,500 | 140,000 | 7 | 30,625 | 10 | 14,000 | 44,625 |
| 12 Tonne Forks | 2 | 35,000 | 70,000 | 7 | 15,375 | 10 | 7,000 | 22,375 |
| 15 Tonne Mobile | 1 | 31,250 | 31,250 | 7 | 6,875 | 10 | 3,125 | 10,000 |
| Total Equipment | | 83,750 | 241,250 | | 52,875 | | 24,125 | 77,000 |
| Fixed Capital | | | | | | | | |
| Quay Wall | 100m | K4,250/m | 425,000 | 25 | 54,187 | 3 | 12,750 | 66,937 |
| Sheds | 3,000 sq.m. | K50/sq.m. | 150,000 | 25 | 19,125 | 3 | 4,500 | 23,625 |
| Park | 1 h.a. | K375/sq.m. | 375,000 | 25 | 47,815 | 3 | 11,125 | 58,940 |
| Total Fixed Capital | | | 950,000 | | 121,127 | | 28,375 | 149,500 |
| TOTAL FIXED CAPITAL AND EQUIPMENT | | | 1,191,250 | | 174,002 | | 52,500 | 226,500 |

N.B. With throughput of 45,000 tonnes per annum. Capital and equipment cost is K5.0 per tonne.
A 12% discount rate.
Excludes site dependent costs, sea and land access and land reclamation.

Source: Derived from Ship Choice in the Container Age.

So far the analysis has concentrated on the ship alone, but a number of other factors strengthen the case for containers and point to increasing penetration of the market. First, and very important, there is undoubted shipper demand and container capacity now required to satisfy the needs of the trade. Second, containers provide the most economically feasible refrigerated capacity. Finally, although this is perhaps less immediate, they provide an easy link with international trades, as they enable transhipment to be accomplished easily, and in principle, economically.

**The Port Sector**

In most circumstances one would expect containerisation to offer substantial savings in port capital costs and cargo handling costs. The position in Papua New Guinea does, however, have a number of special features which modify this expectation. First, many of the coastal services are handled at small single user berths of rather low cost, where the coastal lines operate precisely according to their own needs in providing services to shippers and receivers, and in organising cargo handling and ship scheduling. The Harbours Board wharves on the other hand tend to be rather more expensive and do not offer the operational freedoms required, a point which is pursued further in the section on ports. Further to this, cargo handling costs for shrink wrapped pallets are not very much different from those for FCL boxes.

Since the large multi-purpose ships discussed above for the main port trades would inevitably have to use Harbours Board facilities there might be very little saving in cargo handling costs from the use of containers. However, in principle a modern container operation should not be excessively costly, either in terms of port capital costs as expressed in wharfage and berthage charges, or in labour and cargo handling costs themselves. The first of these points is illustrated in the tables above which show capital and equipment costs for conventional and container systems. These are again standardised costs derived from international

experience, brought as close as possible to Papua New Guinea practice, and show that long run capital costs are less in container systems than in conventional. This point may be expressed in very practical terms by considering the experience of Port Moresby. An expensive new berth was required for container cargoes, but if cargo had not been containerised at least one and possibly two expensive new berths would have been required to handle present throughputs, (including all the Ok Tedi transhipment cargo), by conventional means.

**Transport Geography Ship Operating Patterns And Ship Size**

There is a rather complex traffic pattern in the coastal trade and it can be tackled in a number of ways. First there is the heavy sector between Port Moresby and Lae. This is some 1200 n.m. for the round trip and is currently served by Consort with their pallet operation on a 14 day round trip, as well as PNG Shipping Corporation with their countrywide network. As a full container operation this is almost within the compass of a single small container ship operating a 7 day round trip, as the sailing time is only 5 days even at 10 knots. Any slowing down for pallet or break bulk operations or intermediate ports, or ship waiting time would, however, put it outside the 7 days. But a slightly larger ship could easily do two round trips in three weeks, with a slight impairment in service quality. There also has to be a service from Port Moresby to the islands. This is rather lower density, but could be operated in a 14 day round trip with a 10 knot container ship, the sailing distance Moresby, Rabaul, Kieta, Moresby being some 1700 n.m. It is also possible to include Lae one way whilst still staying within the 14 day round trip. The third option covers Lae to the islands, although there are two axes here as Rabaul is still an important centre. These sectors can be run by a fleet of small ships, rather in the way described above for the Coastal Shipping Company network. Finally, it is possible to put the whole lot into one round trip in the way that PNG Shipping Corporation do and this was also described in Chapter 2. Presently all four strategies are in operation on the coast, and there is also some overlap from Lutheran on the north New Guinea coast and around the islands.

In considering the possibility of rationalisation the key obviously lies in assessing the potential of the relatively large multi-purpose ships with high container capacity described above. In discussing options for this latter service the approach will be to start with the intensive option and work down to the less intensive. However, before starting it is perhaps worth referring back to Table 1.1 although this was admittedly before the loss of the Moresby-Lae beer/empties traffic. This showed that on the heavy Lae-Moresby sector there was some 48,000 revenue tonnes moving in 1980, plus some 10,000 from the islands, whilst from Lae around to Rabaul, Kavieng and Kieta the heavy outbound leg had some 40,000 revenue tonnes plus 11,000 from Port Moresby. Thus there was something just over 1,100 revenue tonnes a week moving from Lae to Moresby and just under 1,000 revenue tonnes from Lae plus Moresby out to the islands. Added to this there should be an allowance of say 20 percent for seasonality to bring peak season figures up to 1,320 tonnes and 1,200 tonnes respectively: and there could of course be some transhipment cargo. Given an average of 20 revenue tonnes per loaded 20' box, the equivalent of some 70 TEUs capacity weekly was thus required for domestic cargoes. Thus the ships we are considering for a domestic weekly service would be of about this size but would of course provide rather more than the container bale capacity if operating in a mixed container break bulk configuration. However, this would have left little space for transhipment of deep sea containers, so the capacity required if a combined operation had been working in 1980, could have been larger than 70 TEUs, although by how much is difficult to say.

The Port Moresby service to Lae, Rabaul and Kieta could in principle be operated with two ships, if it were fully containerised. Let us consider this possibility taking two 70 TEU ships as an illustrative example. The sailing distance on the Moresby, Lae, islands service is some 2,560 n.m., which at 12 knots would take some 9 days sailing time. The container exchange on the round trip with high load factors would be about 400 TEUs. This is two full load and discharge operations with an additional allowance for the fact that there is a complex operational pattern encompassing intra-port cargoes. With the fifteen moves an hour available to a shipborne gantry this would require another 2 days, leaving 3 days slack.

There are, however, a number of disadvantages to the two ship strategy. First, although there are economies of size of large ships at sea, there are diseconomies of speed, and these are quite important as fuel consumption goes up roughly with the cube of the increase in speed and fuel costs are particularly high in Papua New Guinea. Even at a given speed economies of size are not quite so great in the coastal sector as in the deep sea trades, because whereas ships in these latter trades all have similar crew complements, in the coastal trades the complement and particularly the qualifications of the crew diminish with reducing ship size and power and this reduces operating costs. Second, and more important, in order to achieve the high cargo handling rates required with their own gear these ships would have to carry quite sophisticated cargo handling equipment, probably gantries. These would be heavy and very expensive, as well as reducing the container carrying capacity of the weather deck and the ability to handle break bulk cargoes. (N.B. even on a small ship a gantry could weigh over 150 tonnes and cost upwards of K750,000). Shipborne gantries also place quite heavy weights high up on the ship creating stability problems and further limiting the weight carrying capacity of the weather deck. These factors would dissipate the advantage of the intensive itinerary. Further to this, although theoretically feasible the itinerary could well prove inoperable in practice, particularly if pressure built up on common user berths and there was congestion and waiting time. There are other potential difficulties in lack of operational flexibility and vulnerability to ship break down, dry docking, etc. but since it seems that - in the short and medium term future at least - this system would scarcely be operationally feasible, and probably high cost, these need not be further discussed.

The next option is the three ship system with a 21 day round trip and an itinerary similar to that already in action on the coast. This would be very much easier to operate. Speed could be reduced to 10 knots and sailing time would then go up to 11 days. This would still leave 10 days for cargo handling, port access, etc. and with a cargo handling rate of 5 TEUs per hour, achieved with slower cheaper cranes, or derricks, the container exchanges would require 80 hours which consolidates to about 3-1/2 days. Thus a 70 TEU ship could operate comfortably round the circuit, and even extend it somewhat to encompass, Kavieng, Kimbe or Madang. This suggests a single integrated operation could be feasible. Break bulk and pallet operations could be combined with containers on this itinerary.

There is, however, a case for considering the four ship option, with vessels as small as 50 TEUs. This stems partly from the contention that there is a large discontinuity in this area of the cost curve, particuarly in crew costs, but also in maintenance (e.g. dry docking) costs, such that the small ships would actually be cheaper to run per unit of transport capacity, whilst still being large enough to be genuinely multi-purpose and self-sustaining in container handling. It is also argued that four ships would have greater flexibility in responding to changes in the traffic pattern. If there is an issue in ship choice in the coastal trade it is this rather than the question of whether or not a container capacity is required. Whichever way it is resolved, modern ships should have much lower operating costs per unit of transport capacity than the present fleet and would operate with no loss of service quality. Change over then becomes a question of the trade-off between higher capital and lower operating costs and of timing. What is also clear is that the three ship option would allow just one service in the main network, whilst even the four ship option would only allow two, possibly operating with some degree of agreement regarding scheduling and equipment pools, etc..

**Capacity Utilisation**

So far this chapter has been concerned largely with choice of ships and handling technologies, and with the way ships are deployed that is with the efficiency of their route structures and operating patterns. The final element in any appraisal of economic efficiency of the main port freight services must inevitably concern load factors and the utilisation of capacity in the trade. There has in fact been a great deal of criticism of the main ports trade with respect to its propensity to overtonnaging. However, before making any judgement of this allowance must be made for those parameters of a route, which prevent it from achieving the full utilisation of capacity. The first of these parameters is of course cargo balance. Routes vary tremendously in this respect from those with virtually perfect balance to those with absolutely no cargo on the return leg. Attempts may be made to resolve this by operating rather more complicated routes to find back haul cargoes or by chartering in tonnage for one way voyages. But there is a limit to what can be done and poor cargo balance is one of the unavoidable factors which increases transport costs.

The second parameter affecting load factors is seasonality. Its effects can be ameliorated by dry docking ships in the low season or judicious use of chartered tonnage, but as in the case above, this deals with only part of the problem. The Papua New Guinea coastwise trades are seasonal, with a high third and fourth - pre-Christmas - quarter, and somewhat lower first and second quarters, and this is demonstrated by the quarterly returns for 1982.

TABLE 3.5

QUARTERLY RETURNS OF GENERAL CARGO ON MAIN PORT TRADES IN 1982

(Revenue Tonnes)

| | |
|---|---|
| 1st | 58,662 |
| 2nd | 54,150 |
| 3rd | 76,958 |
| 4th | 73,589 |

A third factor concerns changing trends in the overall volume of traffic. A decline in traffic will obviously reduce load factors, and since there are certain barriers to exit (in terms of upsetting scheduling patterns and limited opportunities for re-deployment of vessels) load factors tend to decline, at least until the position becomes so serious that drastic action is imperative. There was a period of rapid growth in Papua New Guinea in the late 1970s which encouraged new tonnage, and the present position is to some extent a reflection of the decline in traffic of recent years. Anticipated recovery of traffic would also justify a certain degree of excess capacity at the current time. A further point is that the cost of overtonnaging varies depending upon its nature. If it is in the form of having a few ships which are a little large, this surplus is provided at low marginal cost and is less serious than having the same overtonnage in a fleet of undersized ships, some of which ought to be taken off the route.

Having made all these qualifications it must still be admitted that there is overtonnaging in the coastal fleet at the moment and it shows every sign of increasing. The trade requires no more than three ships of 70 TEUs or say 2,000/ 2,500 cu.m. bale, and presently has three Consort, two Shipping Corporation, three Coastal, one Poroman and two Lutheran ships, in the trade; with another new ship planned by Coastal, and an increase in capacity planned by the Shipping Corporation. Some of these ships are much smaller than 2,000 cu.m. bale, but if present plans reach fruition the Shipping Corporation alone will have virtually two thirds of the capacity required in the trade and the route will be heavily overtonnaged. This arises from the fact that the licensing authority has not had a clear view of the needs of the trade or long term policy, the effects of this being exacerbated by the recent decline in traffic. In fact alternative strategies have now been pushed to the point where in a competitive market there would almost certainly be price warfare and losses leading to withdrawal of capacity from the trade. For this reason present overtonnaging may no longer be the main issue in the coastal trades. The whole main port system is on the threshold of a major change, in which much of the present capacity is likely to be removed, and new ships introduced and deployed in a new network. It is the efficiency of this prospective new system which may now be an even more important issue.

## A General Comment on the Main Port Trades

In recent years the coastal shipping industry in Papua New Guinea has made a considerable amount of progress. In particular the tightening up of ship registration procedures in the late 1970's has removed a lot of very old and unsuitable tonnage, whilst extension of the licensing period has encouraged new investment. At the same time there has been progress, in terms of some moves towards rationalisation and the increasing use of modern technologies, i.e. pallets and containers.

However, the industry like many others in Papua New Guinea has high unit costs and this has been exacerbated by the fact that it is overtonnaged. The licensing system has not led to rationalisation allowing, (perhaps even encouraging) competition betw[illegible] containers and pallets, and between the PNG Shipping Corporation and Consort. There is also competition between these companies and Coastal in the islands trades and to a lesser extent with Lutheran on part of the New Guinea coast, whilst a recent new entrant is Poroman Shipping which has been allowed to bring an old converted World War 2 water carrier, (the Doilan previously the Gunga Din) into the trade.

The industry has reached a crunch point in terms of technology and the shape of the network which badly needs to be resolved in terms of good modern technology and an efficient operating pattern. Only in this way can the effect of high unit costs, (wages, fuel, repair and maintenance, etc.) be ameliorated to some extent. Finally, (anticipating now some of the issues concerning regulation which will be dealt with later), most important steps in the development of the industry require the agreement of the Minister for Transport in his capacity as licensing authority. Given the present competition within the system each move is likely to be opposed, and instead of rationalisation we have an inefficient competitive process operating through the distorting political medium of a ministerial filter. If the licensing system cannot help the industry to work more purposefully towards rationalisation perhaps it would be in the public interest that lines should pursue their independent views, with rather more freedom and rather less apparent protection than they have today.

## 2. MAIN PORT FEEDER SERVICES

So far the attention of this chapter has been concentrated entirely on the main port trades and within this on that major group of main port trades that come within the compass of a potential nation wide service. This is by no means the whole story and the figures in Chapter 1 showed that there were some 140,000 tonnes moved directly in the main port feeder trades, whilst something approaching 60,000 tonnes, which is ostensibly within the main port trades, actually lies outside the compass of the main network and would be handled by feeder ships. Thus the feeder services are undoubtedly important in tonnage terms and in the national economy.

In spite of this there is not a great deal that can be said about them, as there do not appear to be very many options with respect to choice of technology, or operating pattern. Individual flows are in many cases small and dispersed with services having to be provided to very small ports, so that ship size has to be fairly small. In fact there has been some considerable increase in size in recent years with many new ships being brought into the trade, but even so ships are usually of no larger than say 500 cu.m. bale capacity. This smallness of ship size and consignment size clearly limits the possibilities for the use of containers and the most that can be expected is efficient general cargo handling supplemented by the use of small unit loads, including of course pallets. There is some debate about the details of ship design and about the costs and value of the landing craft concept but this is surely an operational matter to be left to the discretion of individual lines. There may also be some scheduling issues but these are also very much the province of the lines, as it is far beyond the scope of this report to go into the details of feeder port flows and operating alternatives.

The one issue which is important is that of capacity and licensing. Here it would appear that there is some tendency towards overtonnaging. This is a matter of regulatory policy which is discussed in some detail in Chapter 5.

There is one final comment which may be made which is, that as a result of small ship size, feeder services could be much more expensive in terms of ship costs per tonne of capacity provided than the main port services. Thus if the main port trades resolve their problems and begin to use large ships efficiently a substantial differential could arise between the two types of service. This has two implications, first, that the scope of the nationwide service should be as broad as possible to bring as many of the outports as possible within the scope of low cost services, and second, that a need may develop for a restructuring of freight rates, not on a simple route length basis but on one which takes some account of the overall character of the route and vessel size. This could present a quite tricky problem in the future, particularly where the small ships operate a milk run over sectors where the large main port ships also operate, and some attention should be paid to its implications at this relatively early stage.

## 3. PASSENGER AND PASSENGER FREIGHT SERVICES

Many of the passengers referred to in the statistics shown in Chapter 1 are carried on general cargo ships, some of which have special provision. A case has been made that passenger freight ships should be particularly encouraged to extend coastal passenger services to areas not presently covered and help meet an important latent demand.

There may well be a substantial latent demand for passenger services and it might well be of great social benefit for this to be met. Further to this, in some cases coastal passenger and freight traffics match in such a way that combined ships are both efficient and economically feasible. But this is not always the case, and if the flows do not match it could well be very expensive to constrain the design of freight carrying ships in order to meet the needs of passengers. For example, it has been shown above that three large multi-purpose ships could meet the needs of present freight flows in the core main port trades. Modern multi-purpose ships make full use of the weather deck for the carriage of freight, and the provision of passenger capacity on these ships, together with alterations to their itineraries to enable them to serve passengers, could prove to be rather expensive. Even then passenger capacity would be rather limited, and the only way to extend it would be to use more ships with a smaller freight capacity. However, Table 3.2 shows that the operation of small ships would, in principle, involve substantially higher costs for the carriage of freight. In a similar way the limitations of scheduling that passengers impose could be a costly constraint in a freight service. In fact, where flows do not match, it would almost certainly be cheaper to provide a direct subsidy to pure passenger operation than it would be to provide a hidden subsidy by interfering with the efficiency of freight services and thus imposing the equivalent of a tax on all shippers and consignees.

The above comment should not be taken to imply any criticism of the existing passenger freight ships or the excellent service that they provide, but it does suggest that there are likely to be limits on the extent to which they may be expanded.

# REFERENCES

1. Rural Transport Study of Papua New Guinea. Coastal Shipping Survey. Shiptraco Ship and Transport Consultants GMBH.

2. PNG Shipping Corporation. Recommendations on Future Policy, ESCAP 1982.

3. Ship Choice in the Container Age.
S. Gilman, The University of Liverpool Marine Transport Centre, 1980.

4. Containerline Performance and Service Quality
R. Pearson, The University of Liverpool Marine Transport Centre, 1981.

5. Container Logistics and Terminal Design. A manual produced by The University of Liverpool for the IBRD.

6. UNCTAD Port Development TD/B/C.4/115

7. Optimal Shipping Technologies for Routes to Developing Countries. Journal of Transport Economics and Policy.

## CHAPTER 4 - A REVIEW OF FREIGHT RATES & PORT AND CARGO HANDLING CHARGES

There are two sets of freight rates operating in the coastal trades the main port rates and the Gulf rates. Both were revised in February 1983 with a 9 per cent increase, and current schedules are shown in Tables 4.1 and 4.2 below.

### TABLE 4.1
### FREIGHT RATES IN THE MAIN PORT TRADES (KINA)

| Code | Cargo Classification | Unit | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| 1 | Basic Village Foods | M3 | 23-85 | 27-00 | 29-85 | 32-80 | 35-70 |
| | | T | 24-05 | 27-20 | 30-05 | 33-00 | 35-95 |
| 2 | Agricultural Produce | M3 | 25-70 | 28-85 | 31-70 | 34-65 | 37-55 |
| | Empties & Empty Returns | T | 25-90 | 29-05 | 31-90 | 34-85 | 37-80 |
| 3 | General Cargo | M3 | 32-55 | 35-70 | 38-65 | 41-60 | 44-45 |
| | | T | 34-65 | 37-80 | 40-75 | 43-65 | 45-50 |
| 4 | Hazardous & Obnoxious | M3 | 39-95 | 43-15 | 46-05 | 48-90 | 51-85 |
| | | T | 40-20 | 43-35 | 46-30 | 49-10 | 52-05 |
| 5 | Motor Vehicles *up to | 10M3 | 275-00 | 300-00 | 330-00 | 350-00 | 380-00 |
| | up to | 15M3 | 425-00 | 460-00 | 500-00 | 540-00 | 575-00 |
| 6 | Refrigerated Cargo | T | 106-90 | 109-95 | 112-80 | 115-60 | 118-45 |
| 7 | Bulk Cargo | | OPEN RATE | | | | |

Rates include bunker surcharge as at 1st February, 1983.
Flat Rates. Motor Vehicles over 15M3 to be calculated at Category 3

Long Lengths: To items in excess of 6 metres in length the following surcharges apply (to be added to the base rate)
Over 6 metres to 9 metres K 4.50; Over 9 metres to 12 metres K 9.00;
In excess of 12 metres K13.00.

Heavy Lift Cargo: Single lift units weighing over 2 tonnes attract a surcharge of K3.30 for each tonne or fraction thereof to be added to the base rate.

Source: Coastal Shipping Association Freight Calculator, February 1983

## TABLE 4.2
## GULF FREIGHT RATES (1ST FEBRUARY 1983)

| | Cargo Classification (Refer Schedules) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Basic Village Foods | | General | | Produce | Hazardous & Obnoxious | | Empties | Bulk |
| | A | B | C | D | E | F | G | H | I |
| | M3 | T | M3 | T | T | M3 | T | M3 | |
| ZONE A | 28.04 | 28.26 | 28.44 | 31.18 | 30.09 | 38.70 | 38.92 | 20.77 | |
| ZONE B | 31.06 | 31.28 | 31.43 | 34.65 | 33.15 | 43.18 | 43.40 | 22.57 | |
| ZONE C | 33.99 | 34.21 | 34.88 | 38.07 | 36.20 | 47.58 | 47.79 | 26.15 | |
| ZONE D | 37.05 | 37.26 | 38.85 | 40.22 | 39.25 | 47.90 | 48.12 | 27.90 | OPEN |
| ZONE E | 39.01 | 39.82 | 40.15 | 44.46 | 45.52 | 55.03 | 48.54 | 28.29 | RATES |
| ZONE F | 46.99 | 47.79 | 48.32 | 53.64 | 50.69 | 48.32 | 48.54 | 28.29 | |
| ZONE G | 53.51 | 54.31 | 55.03 | 61.15 | 57.56 | 55.03 | 55.25 | 33.66 | |
| ZONE H | 56.86 | 57.67 | 58.42 | 65.01 | 61.38 | 73.57 | 73.79 | 33.66 | |

*RATES INCLUDE BUNKER SURCHARGE AT FEBRUARY 1ST, 1980

Source: Department of Transport and Civil Aviation

**The Structure of Freight Rates**

Perhaps the first point to consider about freight rates is their relationship with distances covered. Table 4.3 below illustrates this by showing the range of nautical miles within each distance code and setting this alongside the freight rates per cubic metre of general cargo.

**TABLE 4.3**
**FREIGHT RATES AND SECTOR LENGTHS**

| Distance Code | Range of Distances n.m. | Rate per cu.m. General Cargo (K) |
|---|---|---|
| 1 | 150 - 348 | 32.55 |
| 2 | 341 - 532 | 35.70 |
| 3 | 550 - 722 | 38.65 |
| 4 | 796 - 950 | 41.60 |
| 5 | 1,038 - 1,049 | 44.45 |

This shows that rates on the short sectors are extremely high compared to those on the longer sectors. In fact, taking the extreme case, the route lengths on Code 5 are four times greater than those on Code 1, whilst the difference in freight rates is only some 37 percent. Of rather more importance than this, however, are the differences in sectors coded 1 to 3 where the dense traffic flows are located. Here differences of some 2 to 3 times in distance are accompanied by changes of only 20 percent or so in freight rates.

One can see how such a structure might have arisen in a conventional coastal service. It could reflect the fact that ship time in port was very high, reducing the effect of distance on shipping costs. The shorter sectors might also have used smaller ships with higher costs per tonne mile at sea. Further to this there is an important component of the freight rate which covers port costs applied to the ships and this does not vary with route length. But these are not the only reasons.

There is clearly a problem in setting rates in a country where there are likely to be quite substantial differences in ship size and operating costs depending on the fundamental characteristics of each individual route. However, the present structure does not appear to offer much support to the country wide service discussed in Chapter 3 above, and would be likely to encourage excessive competition in the shorter sectors along the north New Guinea coast and between Lae and the islands.

The high rates on short sectors allow a rate structure where small ships on a milk run between major ports can have rates aligned with larger main port ships. For example, on the route from Rabaul to Buka and North Solomons (Kieta), the rates for intermediate sectors increase gradually until they build up to the full rate at Kieta, the end of the run. This might make reasonable sense, when both plantation ports and main ports are covered by similar ships, as happens in the area. It could, however, look rather strange if the route containerised, and the main port ships went up to some ten times the size of those in the intermediate sectors.

There is a modest degree of cross subsidy within the rate structure from general cargo to village foods and agricultural produce. There are also higher rates for hazardous and obnoxious cargoes and for refrigerated cargoes, but these are more expensive to ship, particularly the latter, and this makes it impossible to determine whether or not there is cross subsidy. However, these two aspects of the rate structure present no particular issues.

### A Comparison With Overseas Rates

One of the criticisms of the coastal shipping industry is that its rates are extremely high in comparison with deep sea rates and this point is explored in Table 4.4 below, where the Rates for Code 3, (which as shown above are relatively low for Papua New Guinea) are compared with a selection of deep sea rates.

## TABLE 4.4
## A COMPARISON OF FREIGHT RATES

| | Kina/Revenue Tonne | |
|---|---|---|
| Coastal G.C. Code (3) | 38.6 | |
| Lae-Singapore | 44.4 | |
| Copra to Singapore | 42.4 | |
| Timber to Japan (liner terms) | 29.7 | |
| Inwards from Japan | 50.8 | |
| Inwards from Australia | 112.0 | (av.) |
| Coffee to Europe | 144.1 | |
| Inwards from Europe | 84.7 | |

Source: Shipping Agents

From this it is clear that even Code 3 rates are high in relation to deep sea rates. Rates to Japan and Singapore in particular compare quite closely with the Code 3 rate and indeed timber exports to Japan are below it. The rate for imports from Australia is rather high, although this is a poorly balanced trade and has to contend with the problems of the Australian waterfront. Inwards rates from Europe some 9,000 n.m. from Papua New Guinea are, however, only just over double the Code 3 rate with a sector distance averaging only about 650 n.m.

There are a number of reasons why freight rates should not be expected to vary directly in relation to distance. In particular deep sea ships are very much larger than coastal vessels, and would be expected to have lower costs per tonne mile. But this is not the whole reason. The coastal trade has high factor costs, fuel at K350 per tonne compared to K152 for marine fuel oil in international ships, for example. It is also overtonnaged and relatively uncompetitive. This is a crucial

point, if a transport system has necessarily to work with small ships, poor cargo balance and high labour and material costs, it is absolutely essential that it be as efficient as it is possible in terms of ship choice, operating configuration and the highest feasible load factors. Otherwise inefficiencies in these areas work on the high cost base to produce the extraordinarily high levels found in Papua New Guinea.

One final international comparison may be made for routes of some 250 n.m. in Europe, equivalent to the median sector length in Code 1. Here rates of some US$6 per cu.metre of cargo are only about one quarter of those on the Papua New Guinea coast.

**Cargo Handling Charges**

There are certain particular aspects of coastal rates, to which attention should be drawn.

First and most important is the very high level of port and cargo handling charges. The following example drawn from the freight calculator will illustrate the point. Fifty two Kina out of the total freight is shown for handling at the loading and discharge ports, but this only covers costs from the hook through the port gate, there is approximately another K3 per tonne at each end for stevedoring (i.e. cargo handling in the ship) or K30 in the example shown, which is borne by the lines and recovered in the freight rate. All told some K82 of the total K256 is for cargo handling, which is virtually one-third of the total.

## TABLE 4.5
## AN EXAMPLE OF THE STRUCTURE OF COASTAL RATES

**General Cargo**

| | |
|---|---|
| 5.00M3 (1.50T) cargo Port Moresby/Lae - Distance Code 3 | |
| Basic Freight 5.00M3 @ K38.65 | 193.25 |
| Bunker Adjustment Factor (BAF) 5.00M3 @ ruling charge | NIL |
| Wharfage at Loading Port 5.00M3 @ K1.18 | 5.90 |
| Handling at Loading Port 5.00M3 @ K5.20 | 26.00 |
| Wharfage at Discharge Port 5.00M3 @ K1.00 | 5.00 |
| Handling at Discharge Port 5.00M3 @ K5.20 | 26.00 |
| TOTAL | K256.15 |

Source: PNG Shipping Association Coastal Branch Freight Calculator.

The example above was for general cargo on distance Code 3, for shorter distances and lower rated goods the proportion represented by stevedoring costs will be higher although the reverse will obviously be the case for the very long distances and high rated goods. Other disadvantaged sections are those where there is transhipment. Some allowance is made in the freight rate, but because of the high incidence of stevedoring costs the total still escalates, although at plantation ports the consignees may escape some of this by doing part of their own cargo handling.

## A Comparison of Container and Conventional Handling Charges

Table 4.6 below compares port and cargo handling costs for FCLs, LCLS and conventional cargo.

TABLE 4.6
CONTAINER & BREAK BULK PORT & HANDLING CHARGES
(K. per revenue tonne)

| | Coastal | | | Overseas | | | Tran-Shipment |
|---|---|---|---|---|---|---|---|
| | Break Bulk | LCL* | FCL[a] | Break Bulk | LCL | FCL | |
| Wharfage | 1.18 | 1.18 | 1.18 | 3.75 | 3.75 | 3.75 | 2.47 |
| Stevedoring | 3.30 | 1.20 | 1.20 | 3.30 | 1.20 | 1.20 | 3.44 |
| Handling | 5.20[b] | 5.20 | 2.20 | 5.20 | 5.20 | 2.20 | |
| Overtime & delays[c] | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Receipt and Delivery etc. | 0.80 | 0.125 | 0.8 | 0.8 | 0.125 | 0.80 | 0.24 |
| | 11.48 | 8.70 | 6.38 | 14.05 | 11.27 | 8.95 | 6.15 |

a. assuming 27 revenue tonnes per FCL.
b. reduced to K4.0 for palletised cargo and K3.0 for shrink wrapped cargo.
c. this average depends upon port conditions. Port Services PNG Ltd. report that the average for recent months is something less than 50 toea per ton. Lines are very concerned with individual occasions when it rises to several kina per ton.

This table confirms the very high overall level of port and cargo handling charges. There are some savings from the use of containers, although they are not as high as might be expected. Indeed, where the shrink wrapped pallets are used, which reduces conventional cargo handling costs by K2.20 there is relatively little difference between conventional handling and LCL containers. A further point concerns the rather high charges which are sometimes levied by port services at Port Moresby for overtime and delays. These are outside the control of coastal

lines and this is one good reason why they are so keen to use their own facilities. The large container ships would have no option but to use Harbours Board facilities, and this is one of the barriers to the development of the container system on the coast. Finally, transhipment is expensive, bearing in mind high coastal freight rates as well as port costs. If a container happens not to be on a through Bill of Lading, or has to be broken down at the transhipment port for conventional handling, they can rise to extraordinary levels. This clearly limits the potential for cooperation with international lines. It also adds weight to the recommendation in Chapter 3 above, that deep-sea ships be allowed to operate around the fringes of the coastal network.

# CHAPTER 5 - REGULATORY POLICY

**Regulatory Instruments**

The legal basis for the regulation of coastal shipping was provided in the Merchant Shipping (Coasting Trade) Act 1977. Section 215B of this Act allows the Minister to grant licences for ships to engaged in the coasting trade, subject to 'any conditions he thinks fit'! There are two categories of licences 'general' which allows a ship to operate anywhere in the coasting trade and 'special' which limits the routes on which the ship may be engaged. Under Section 215E licences may only be granted either to the owner of the ship or the charterer - provided that he is a qualified person.

Under Section 215F the Minister may also determine the duration of licences, having regard to:

(a) the age, size and condition of the ship; and

(b) whether or not the person seeking the grant of licence is the owner of the ship; and

(c) the suitability of the ship for the trade or service.

Under Section 215F (3) general licences issued for registered ships are for a period not exceeding eight years and for unregistered ships for a period not exceeding five years, or, where in order to obtain a service requirements for registration of the vessel and suitability of the owner are waived, for two years.

Under Section 215H (1) the Minister may, where he considers it necessary to do so

(a) cancel a coasting trade licence; or

(b) subject to Section 215F vary any condition under which a Coasting trade licence is issued.

Under Section 215J the Minister may require the holder of a licence or applicants to furnish information with respect to:

(a) voyages made or to be made; and

(b) cargo carried or to be carried; and

(c) passengers carried or to be carried; and

(d) shipping services performed or to be performed,

by the ship in respect of which the licence or permit is or is about to be granted or issued and -

(e) descriptions of the operations involved in; and

(f) financial matters connected with,

the provision of the shipping services in respect of which the licence or permit is, or is about to be, granted or issued.

Under 215L the Minister may also issue permits to allow non-coasting trade vessels to supply services.

Section 215N of the Act establishes a Coasting Trade Committee which under 215O consists of:-

1. (a) an officer of the Department of Transport who shall be the Chairman of the Committee; and

(b) two members to represent the interests of shippers or producers of goods customarily carried in ships engaged in the coasting trade; and

(c) one member to represent consumers of goods customarily carried in ships engaged in the coasting trade; and

(d) three members to represent the holders of coasting trade licences.

Under Section 215P the Coasting Trade Committee is deemed to be a Committee of Advice and the functions spelt out in 215Q are as follows:-

(a) advise the Minister on any matter relating to the coasting trade; and

(b) report to the Minister on any proposed Regulation relating to the coasting trade, and shall

(c) within 60 days of being requested by the Minister so to do, recommend a rate that it considers to be the maximum rate that should be charged for a particular shipping service.

Section 215S provides for investigation of rates by the Coasting Trade Committee, whilst 215T allows the Minister to fix maximum rates.

The Act set out to resolve an unsatisfactory regulatory position in which licences were granted for only one year and the industry had been unable to develop. By increasing the period for which licences could be held to eight years and providing in theory some protection against overtonnaging it can probably be judged to have had some beneficial effects. Certainly the industry has developed and a great deal of new tonnage has been brought into the trade.

What is also clear about the Act, however, is that it gives the Minister enormous power. It was also probably intended this power would be benevolently used and that the Minister would take a great deal of notice of the Coasting Trade Committee. In the early days of the regulatory regime the advice of the Coasting Trade Committee was often taken, possibly even rubber stamped. But in recent years it has been ignored on several occasions thus confirming the extent of the Minister's powers and exposing the relative impotence of the Committee. In fact in theory the powers available to the Minister are so wide that the very granting of licences could be rendered almost meaningless, first, because the Minister may allow the trade to become overtonnaged and secondly because he may rescind licences if he deems this to be in the public interest. Criteria for adjudging the public interest are nowhere defined in this Act and the Minister does not usually justify his actions. Following recent attempts to rescind certain licences shipping lines have had recourse to the courts to obtain temporary injunctions. This was

under "judicial review of administrative action" by which a Minister's decisions may be reviewed in the courts to ensure that he has acted correctly, both in terms of the Acts which give him his power and also with reference to common law. So there is some check on Ministerial powers. If the present Act were reformed, judicial review would be available to ensure that Ministers acted in accordance with any criteria established in a new measure.

In many of the Acts which regulate the behaviour of shipping conferences shippers figure prominently. Thus under U.S. law lines or conferences may not discriminate between shippers similarly situated and they have common carrier obligations for service placed upon them. Some regimes also make provision for Shippers' Councils and invest them with authority to negotiate rates, the lines having to submit to them independently verified accounts. One may have some reservations concerning the effectiveness of Shippers Councils but at least the existence of shippers is acknowledged and it is accepted that shipping services are provided for their benefit. Under the Merchant Shipping Act they are relegated to participation in the Coasting Trade Committee and within this work alongside members of the industry and government departments who probably have much more influence upon the advice tendered to the Minister.

A further weakness of the Coasting Trade Committee lies in the fact that although the members drawn from the industry are expected to represent the interests of all licence holders, they cannot be other than interested parties. For this reason they may even lose the support of other members of the industry who might in any case feel that a direct approach to the Minister or his advisors would be justified and possibly more effective.

**General Discussion of Principles Relating to Regulation**

The economic case for having a regulated system lies in the contention that in its absence the route, would either be over-tonnaged and destructively competitive or alternatively monopolistic. Regulation aims to prevent these abuses, first by controlling the capacity allowed to operate on the route and second by controlling

rates. Thus in principle an economic operating configuration is attained, whilst lines are allowed only normal return on capital. If these assumptions were justified shippers would simultaneously be obtaining a good deal. However, there is a problem which is to ensure that the industry protected by licensing is genuinely efficient. In this context it is not enough to avoid overtonnaging, ships must be of the correct size, speed and type, their deployment must be effective, and port performance must be efficient. It is not easy to regulate for all of these matters, indeed if the attempt were made, the whole system would become bogged down in an impossible bureaucracy. Yet without some strategy against which to monitor performance, how in the absence of competition can the regulatory authority be sure that it is not simply cossetting an uneconomic operation?

A debate very similar to this has surrounded the question of shipping conferences in the deep sea liner trades. This has gone on for just one hundred years and much of the evidence given to the Royal Commission on Shipping Rings in the United Kingdom in 1904 and to the Alexander Committee in the United States in 1914 dealt with these questions. For most of this period deep sea routes have been under the control of conferences, and this system has worked reasonably effectively although even a closed conference does not have the absolute barriers to entry to a route, which is provided by a regulatory system. Further to this freight rates are negotiated between lines and Shippers Councils rather than being government controlled. In recent years there have been a number of new developments in policy towards conferences. In the United States since 1961 this has taken the form of an attempt to use a powerful regulatory authority and the law to ensure that conferences conform to the public interest, interpreted to mean that there should be as much competition as possible. Meanwhile the United Nations Liner Code was formulated in UNCTAD, as an attempt by developing countries to use powerful closed conferences to increase their share of liner trades. Finally some of the closed conferences, evolved (following containerisation of their routes) into what has been called the COAR system (co-operatively organised and appropriately rationalised). On these routes containerisation led to a sixfold increase in ship size, and this offered size economies as well as reducing the amount of capital required to containerise. This encouraged lines to amalgamate their individual operations into one or a limited number of major services.

This cartelisation of the route is legal under immunities from anti-monopoly laws granted to conferences early in this century. Certain governments have also taken a hand in this in encouraging lines to come together and rationalise whilst at the same time supporting strong "Shippers' Councils". The Australian government provides the classic example of such a policy. It encouraged shippers to form Shippers' Councils in the early post-war period and has since followed a consistent policy of encouraging rationalisation by the lines and strengthening the Councils. The Australian route containerised with two services in the early 1970s, one cellular container and one container/ro-ro. It has served the needs of the Australian trade well and has been reasonably efficient. In recent years, however, it has become subject to fringe competition from ABC line which operates conbulkers. Australian Shippers' Councils have also followed a more active policy of encouraging, non-conference competition in recent years, if only to give themselves more leverage at the negotiating table.

One other aspect of general experience may be mentioned here. This concerns the so-called 'ratchet' effects argued to exist in the open conference system. The 'ratchet' effect is based on Chamberlin's original perception that in markets where price maintenance was associated with open entry, there was a tendency for over capacity to develop for which there was no easy remedy. What was postulated to happen was that the profits made in the market would attract entry, following which prices would be jacked up to allow profits to be made again in spite of reduced utilisation and so on. Devanny has argued that this 'ratchet' effect (a ratchet because prices only move upwards) is a classic fault of the open conference system - the conference being the price fixing body and the open entry encouraging surplus capacity. If one examines the experience of open conferences, there does not seem to be much proof of ratchet effects, as over capacity often leads to fierce price wars, followed by some degree of rationalisation. A ratchet effect could, however, exist in a regulated system like that of Papua New Guinea in which capacity control was weak, but was associated with government backed price fixing. In fact the illusion of capacity control presented by a licensing system could be a positive encouragement for potential new entrants on a route already adequately provided for. This could be exacerbated by anomalies within the rate structure like those described in Chapter 4 above.

**The Operation of the Regulatory System in Papua New Guinea**

There is a case that regulation of the coastal shipping industry, has provided the protection necessary for a fledgling industry and has encouraged investment, growth, and a considerable degree of progress.

However, as it has operated in recent years there have been a number of quite serious defects. First there is a strong indication of 'ratchet' effects, and the growth of capacity not really required in the trade. Recent licences for Poroman and Coastal Shipping are cases in point, and in a number of cases the Minister has ignored the advice of the Coasting Trade Committee and does not seem to have taken much account of overall needs of the trade. If such growth is allowed when the market is fairly weak, it increases overtonnaging and also appears arbitrary and inequitable to other companies operating within the system. This has been exacerbated by recent moves to rescind certain licences, using the powers described above. It should not be part of any regulatory system, for existing licence holders to have their permits to trade suddenly withdrawn for reasons other than those relating to safety or legality of the operation. This cuts at the heart of the security which the system aims to provide, is an admission of failure by the regulatory authority, and adds a further political dimension to the whole regulatory process. It could well be the case that some companies might be forced out of the trade. This could happen for example if they could not live with rates acceptable to the other lines, but at least this would be by something approaching normal functioning of the market not by arbitrary fiat of the regulatory authority. The other disquieting point about this process is its covert nature, with the companies affected having precious little warning or knowledge of the case against them. In some instances they scarcely had an opportunity to present a case to the Minister although fortunately they had recourse to the law.

One further difficulty about the present operation of the regulatory system is a conflict of interest which stems from the existence of the PNG Shipping Corporation. The government obviously wishes this line to recover, and with the very best will in the world this is likely to affect licensing decisions. This leads on to a more fundamental difficulty with the regulatory process which arises from the fact that in the absence of competition it is necessary to have some idea of

what shape an efficient industry would have. This is not to say that the government should try to impose a plan by meddling in the detail of operations, but because in the absence of such an idea it is scarcely possible for government to have a policy or meaningful dialogue with the industry.

Without an effective blue print mutually incompatible strategies will be allowed to develop within the system, and this has happened in Papua New Guinea as shown in Chapters 2 and 3. If the government now pursues a policy for the development of a main port network, with relatively large multi-purpose container ships, some of its recent licensing decisions allowing growth in competing approaches will look decidedly odd.

Most of the lines consulted on this study like the idea of a regulated system with entry controlled by the issue of licences. However, the way the system works at the moment it is the worst of all worlds. In particular it does not guarantee efficiency and even the security it appears to offer may turn out to be illusory. The position could perhaps be retrieved if the government and the industry could establish a long term strategy for development of the main port system. Certain guidelines can be established in terms of ship choice and operating strategy and some of the issues involved were discussed at some length in Chapter 3. If this were done the amount of regulatory intervention would reduce, a limited number of licences would be granted in accordance with the agreed strategy, and the system would then hopefully settle down for a longish period.

**The Closed Conference Model**

There is an alternative model of industry operation which as mentioned above has been established for over one hundred years in deep sea trades and deserves some consideration. This is the closed conference or COAR model referred to above. Under this system the government would protect the industry from competitition from overseas ships. The major main port lines would form themselves into a conference which would itself agree upon and implement a rationalised approach to the trade. Routes would be set by the conference, following negotiations with a Shippers' Council.

There would be a contract with shippers in which dual rates were allowed, those shippers who moved all their cargo with the conference receiving a rate some 10 per cent to 15 per cent better than those who made use of outsiders. There would then be two barriers to entry. One would be the fact that any potential new entrant to the trade would have to match the main port service for low cost efficient operations and service quality and would know he would inevitably be in a price war on any sector he entered. The second would be that, if he only operated on one sector, shippers using his service would lose their discount on other sectors. This system might be reasonably stable, the only problem being that it only requires one quite small ship on an annual charter to have a go at a major sector and upset the viability of the whole system. So there would remain the possibility of fierce competition and this could reduce the breadth of main port service.

These then are the main elements in the choice concerning the regulatory system, a present position which is unsatisfactory but could perhaps be reformed if the government and the industry could establish an effective long term strategy, and an alternative conference model which would retain the threat or reality of competitition, but where natural barriers to entry might be so weak as to lead to excessive competition and loss of breadth in the system and of service quality to the smaller sectors.

This is not a particularly easy choice and it is tempting to suggest that the industry should continue to be regulated with the government encouraging the development of the main port strategy outlined in Chapter 3. Even if this policy were accepted the present Coasting Shipping Act is considered to be highly unsatisfactory for reasons mentioned at the start of this chapter and should be reformed. However, given the nature of the difficulties in the regulatory system; (the inevitable politicising of, almost all industry decisions - which is a fault as much of the lines as it is of government; the dangers of ratchet effects and of the protection of inefficient practice, and finally the sheer burden on government in having to monitor permanently the development and operation of the industry) the recommendation of this report is for a measure of de-regulation and a move in the direction of a conference system.

**The Nature of De-Regulation: Protection from Competition by Overseas Ships**

One of the main features of the present regulatory regime is that it provides protection from competitition by overseas ships. In fact overseas ships used in the 1960s to carry coastwise traffic, but this was in the days before the Australian trade rationalised and the conventional ships employed used to operate on a milk run around the coast.

There is no doubt that international ships could carry coastwise cargoes, but there are a number of disadvantages to this. First the priorities of any international line are necessarily those of its deep sea service. It was mentioned in earlier chapters that deep sea lines change their operating strategies from time to time, and this could easily affect their abilities to handle coastwise traffic. Further to this on the longer deep sea routes using larger ships there is likely to be some disturbance in scheduling which would affect frequencies, and the possible trend in this area would be to trim itineraries and use coastwise shipping to help in this process. In fact it is probably only the container ships on the Australian service which could conceivably operate with the regularity required in the coastwise trade. These ships would face some problems in meeting coastal needs. They operate frequently, every seven to ten days on the Moresby-Lae sector, but only every third voyage to the islands, and they seldom do Lae-Moresby, preferring to go straight back from the islands to Australia. In fact every third ships goes from Lae straight to Honiara and could not sensibly include Moresby on the itinerary, as this would take it in the opposite direction to its intended route. Further to this they do not close the islands circuit back to Lae. Operation of their existing itineraries would, therefore, leave gaps in the coastwise service, and possibly create all sorts of box balancing problems, whilst re-arrangement of their itineraries, could be rather costly, for the relatively small flows on some of the coastwise sectors. Finally, the Australian waterfront is notoriously strike prone and reliance on Australian ships could lead to serious interruptions in the coastal service. For all of these reasons there is a strong case that the government should continue to reserve coastal shipping for a coastwise service. However, there are certain sectors which are rather inconvenient for the main port coastal network, Moresby-Vanimo for example. These small flows could usefully be tidied up by international services, saving on the high costs of transhipment discussed in Chapter 4.

If the coastwise network were made completely open, there would undoubtedly be entry from Asian and Flag of Convenience operators. However, many countries reserve coastwise cargoes for national carriers and this has to be accepted as a legitimate national policy.

The recommendation, therefore, is that the coastwise trade be reserved for Papua New Guinea companies in the same manner that operates at the moment, but with the small proviso relating to tidying up at the fringes of the network mentioned above. This would mean that all companies within the trade would be operating according to the same ground rules and in a common cost medium. Within this framework the industry could be de-regulated and move towards a conference system. This would involve the establishment of a Shippers' Council whilst the lines themselves could form a conference or operating agreement for the main port services, and would be allowed dual rate contracts. Meanwhile the Coasting Trade Committee would become redundant. The Minister for Transport would still retain some powers over the trade by being able to prevent entry of old or unsuitable tonnage, or of lines which did not appear to have the financial or other resources required for a regular liner type service, but the threat of outsider competition would exist for main port services. Freight rates would be negotiated between the Shippers' Council and the lines and this should allow the evolution of a more sensible rate structure than that which exists at the moment.

## TABLE 5.1

## CHIEF CONTAINER SERVICE FROM AUSTRALIA (MARCH TO MAY 1983)

| VESSEL | VOYAGE | PORT MORESBY | LAE | KAVIENG | RABAUL | MADANG | WEWAK | KIETA | HONIARA |
|---|---|---|---|---|---|---|---|---|---|
| NIMOS | 66 | | | 18/3 | 19/3 | | | 20/3 | |
| PAPUAN CHIEF | 70 | 25/3 | 28/3 | | | 30/3 | 31/3 | | |
| CORAL CHIEF | 69 | 3/4 | 5/4 | | | | | | 8/4 |
| NIMOS | 67 | 10/4 | 13/4 | 15/4 | 16/4 | | | 17/4 | |
| PAPUAN CHIEF | 71 | 20/4 | 23/4 | | | 24/4 | 25/4 | | |
| CORAL CHIEF | 70 | 30/4 | 3/5 | | | | | 6/5 | |
| NIMOS | 68 | 7/5 | 10/5 | 13/5 | 14/5 | | | 15/5 | |
| PAPUAN CHIEF | 72 | 21/5 | 23/5 | | | 25/5 | 26/5 | | |
| CORAL CHIEF | 71 | 28/5 | 31/5 | | | | | 4/6 | |

Source: New Guinea Australia Line

# REFERENCES

1. Alexander Commission Report

2. Royal Commission on Shipping Rings

3. The Theory of Monopolistic Competition (Chamberlin)

4. Conference Rate Making on the West Coast of South America (Devanny)

5. The Economies of Ocean Freight Rates, (Bennathan and Walters)

6. The Competitive Dynamics of Container Shipping (Gilman)

7. Merchant Shipping (Coasting Trade) Act 1977.

# CHAPTER 6 - PORT FACILITIES AND STEVEDORING

The terms of reference in the port sector was concerned with three aspects, the general adequacy of port facilities, the stevedoring arrangements of the Harbours Board and the level of stevedoring costs. Following an introductory statistical section to establish the background to the problem, these will now be dealt with in turn.

## 1. THROUGHPUT

The throughput of coastal general cargoes of the main ports in 1980, as defined by the Department of Transport Freight Study Bureau is set out in Table 6.1 below.

This shows that there are three main ports in the coastal general cargo trade, Lae, Port Moresby and Rabaul, three very much smaller second level ports Madang, Wewak and Kieta, and finally a range of small ports all with throughputs of under 17,000 tonnes.

The three main ports all have somewhat different functions in coastal shipping, Lae is primarily an expo.. centre in the intra main port trades, whilst Port Moresby has a much smaller main port trade, which is balanced, in total, but also acts as a centre for feeders to the Papuan Gulf and the West. Finally Rabaul has a balanced intra main port trade of a similar size to Port Moresby, and also acts as a base for feeder trades, this time around the islands. Taking the second level ports, the trades of Wewak and Kieta were heavily oriented to inbound main port cargo, whilst Madang had a balanced trade as well as rather more feeder cargoes than the other two.

## TABLE 6.1
## COASTAL GENERAL CARGOES - INTRA MAIN PORT AND MAIN PORT FEEDER 1980

### Coastal Cargoes Through the Major Ports

| | Main Port | | | Feeder/Main Port | | | Total |
|---|---|---|---|---|---|---|---|
| | In | Out | Total | In | Out | Total | |
| Lae | 44,701 | 123,196 | 167,997 | 5,196 | 12,039 | 17,235 | 185,232 |
| Port Moresby | 44,482 | 43,523 | 88,344 | 14,142 | 39,942 | 54,084 | 142,428* |
| Rabaul | 39,653 | 33,134 | 72,787 | 25,030 | 32,049 | 57,079 | 129,866 |
| Madang | 18,788 | 15,902 | 34,690 | 3,483 | 4,411 | 7,894 | 42,584 |
| Wewak | 25,166 | 7,164 | 32,330 | 14 | 221 | 235 | 32,565 |
| Vanimo | 5,536 | 2,002 | 7,538 | 12 | 27 | 39 | 7,577 |
| Kieta | 23,951 | 10,038 | 33,989 | 1,101 | 1,455 | 2,556 | 36,545 |
| Kavieng | 9,122 | 2,693 | 11,805 | 316 | 157 | 473 | 12,278 |
| Alotau | 8,207 | 3,125 | 11,332 | 806 | 1,160 | 1,966 | 13,298 |
| Samurai | 4,264 | 1,054 | 5,318 | 164 | 610 | 774 | 6,092 |
| Oro Bay | 10,947 | 2,900 | 16,983 | - | 116 | 116 | 17,099 |
| Lorengau | 5,644 | 2,324 | 7,978 | 5 | 54 | 59 | 8,027 |
| Kimbe | 9,551 | 3,175 | 12,726 | - | 13 | 13 | 12,739 |

* Excludes Ok Tedi

Source: Department of Transport Freight Study Bureau.

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Table 6.2 below shows the trend from 1977 to 1980, although these figures are all cargoes, rather than just general as shown in Table 6.1. However, the table indicates a fair rate of growth at Lae, and modest growth at the other two large ports in the system. There was also moderate growth at the three secondary ports over the period.

## TABLE 6.2

## MAJOR PORTS : INBOUND/OUTBOUND TRAFFIC VOLUMES 1977-1980

| | 1977 | | | 1978 | | | 1979 | | | 1980 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 000s Revenue Tonnes | In | Out | Total | In | Out | Total | In | Out | Total | In | Out | Total |
| **Coastal Cargo** | | | | | | | | | | | | |
| Kieta | 26 | 9 | 35 | 34 | 14 | 48 | 28 | 13 | 41 | 32 | 11 | 43 |
| Lae | 36 | 138 | 174 | 61 | 177 | 238 | 63 | 160 | 223 | 71 | 182 | 253 |
| Rabaul | 65 | 68 | 133 | 73 | 70 | 143 | 75 | 61 | 136 | 79 | 80 | 159 |
| Port Moresby | 55 | 75 | 130 | 60 | 84 | 144 | 55 | 81 | 136 | 67 | 76 | 143 |
| Madang | 20 | 21 | 41 | 32 | 24 | 56 | 24 | 22 | 46 | 29 | 28 | 57 |
| Kimbe | 16 | 6 | 22 | 15 | 6 | 21 | 15 | 5 | 20 | 17 | 6 | 23 |
| Kavieng | 15 | 5 | 20 | 17 | 7 | 24 | 17 | 5 | 22 | 19 | 6 | 25 |
| Wewak | 31 | 12 | 43 | 36 | 16 | 52 | 31 | 12 | 43 | 36 | 16 | 52 |
| Others [b] | 39 | 12 | 51 | 48 | 13 | 61 | 48 | 13 | 61 | 51 | 18 | 69 |
| Total[c] | 303 | 346 | 649 | 376 | 411 | 787 | 356 | 372 | 728 | 401 | 423 | 824 |

Totals may not add due to rounding.

(a) Metric tonnes or cubic metres.

(b) Other major ports include Alotau, Lorengau, Oro Bay, Samarai and Vanimo.

(c) Cargo loaded or discharged at feeder ports not included, but cargo carried between two of the major ports is double-counted in the total.

Source: Freight Study Bureau, Marine Division, D.T.C.A.

## 2. REVIEW OF FACILITIES

It is clearly not possible with the limited time available for this study to undertake a comprehensive analysis of facilities. In any case the Papua New Guinea Harbours Board's handbook of information provides excellent layouts of all major facilities. Further to this the Asian Development Bank has funded a comprehensive review of the port system, with a view to developing policies for rehabilitation, and enhancement. This study which is to be carried out by Maunsell and Partners, is shortly to begin and will produce its recommendations later this year. Finally, it may be noted that throughputs generally in the system have since 1980 been rather steady, (with the exception of course of Ok Tedi project cargo passing through Port Moresby), and there is presently no serious congestion at any of the ports. For these reasons the review of facilities will be limited to a short general discussion of at Port Moresby, Lae and Rabaul.

### Port Moresby

Prior to the recent completion of the new container berth (No. 4), Port Moresby consisted of the old main wharf, (with its two outside deep sea berths and two inside coastal berths), plus the string of small coastal jetties coming off from Stanley Esplanade.

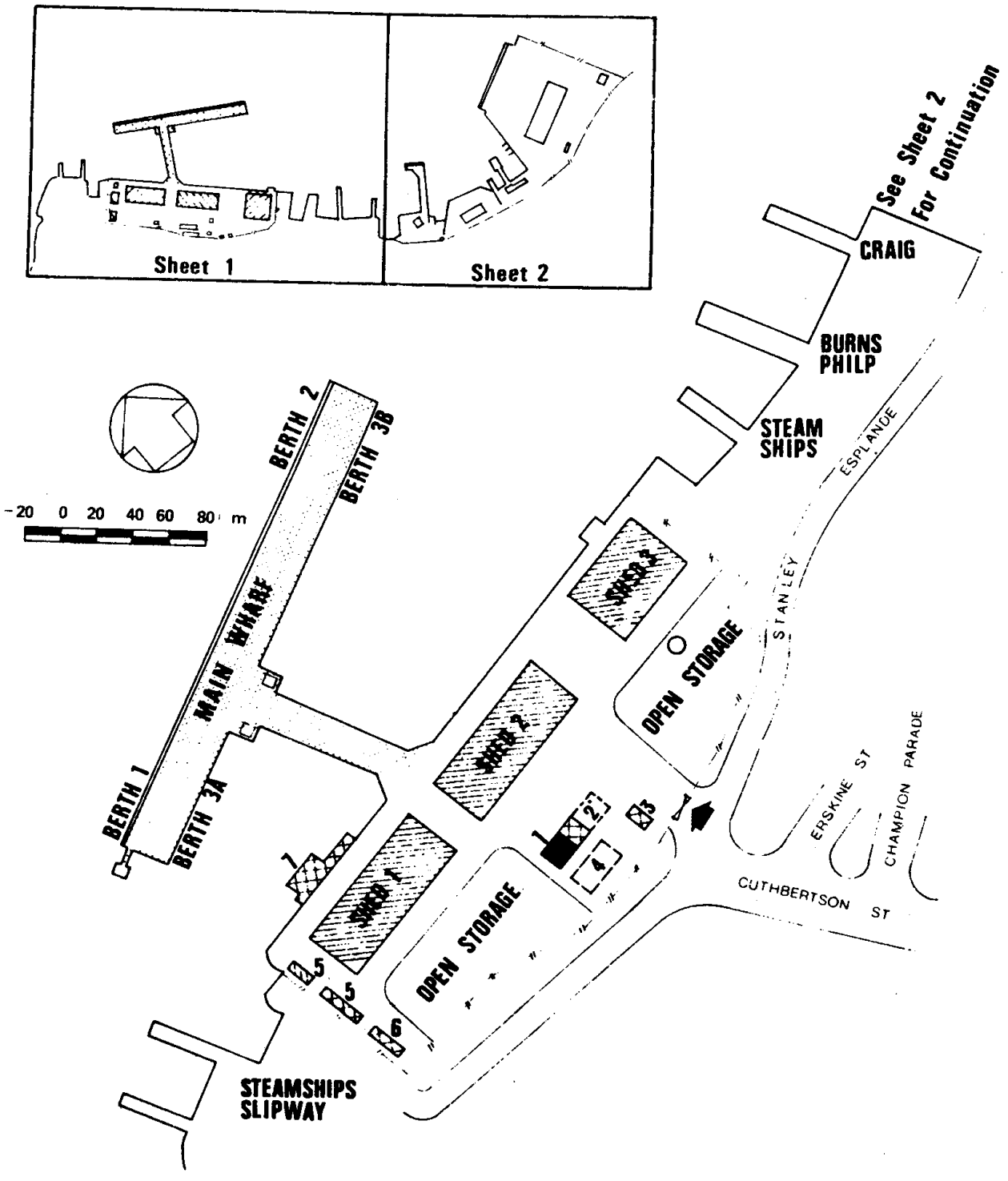
The main wharf is now to be rehabilitated and this together with the No. 4 berth will sustain the present set up of two Harbours Board facilities with the coastal facilities between them.

Taking the Harbours Board facilities. No. 4 berth can deal adequately with container handling rates of 20 plus per hour, which are within the compass of self-sustaining ships with gantries. (It also handles all Ok Tedi cargo and a barge berth is now being added to facilitate this). The main wharf handles deep sea ships, both conventional and semi-container, and also the larger coastal ships the Moresby Chief and the New Guinea Coast. Some of the containers move to No. 4 wharf by tractor trailer along the Stanley Esplanade. This is a public road and the small coastal ships are worked across it. This is a rather messy operation though a matter of history and site conditions, rather than the port planning of recent years.

The port development question at Port Moresby, will in fact revolve partly around the choice of ship and technology made by the coastal operators. If they containerise, and particularly if they choose fairly big ships with a container handling rate which is at least moderately high, then there will be a natural transfer of ship shore transfer away from the present coastal facilities to No. 4 berth and the main wharf. In fact taking the 1980 figures of Table 6.1 some 88,300 revenue tonnes of general cargo was in the main port trades. Some of this is already handled by Harbours Board facilities but the balance would switch. Meanwhile 54,000 tonnes was in the main port feeder services which would stay in the central area. This would reduce the emphasis on the central area transferring it towards the main wharf and No. 4 berth, and its possible extension. If on the other hand the coastal operators stay to some extent with the present pallet type operation, the need to do something for the present coastal facilities will be rather more pressing.

These choices are properly a matter for the new study and the issue cannot be further pursued without traffic data from the TIMS Study and engineering data from Maunsell & Partners . The main point here has been to emphasise the significance of the choices facing the coastal operators outlined in Chapter 3 and their inter-relationship with the port development options.

# PORT MORESBY Sheet 1

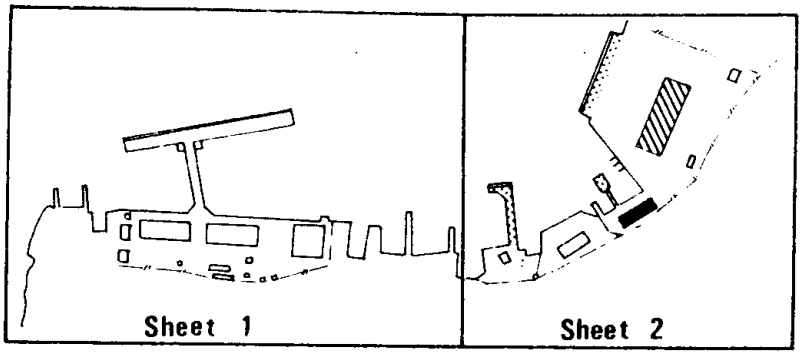


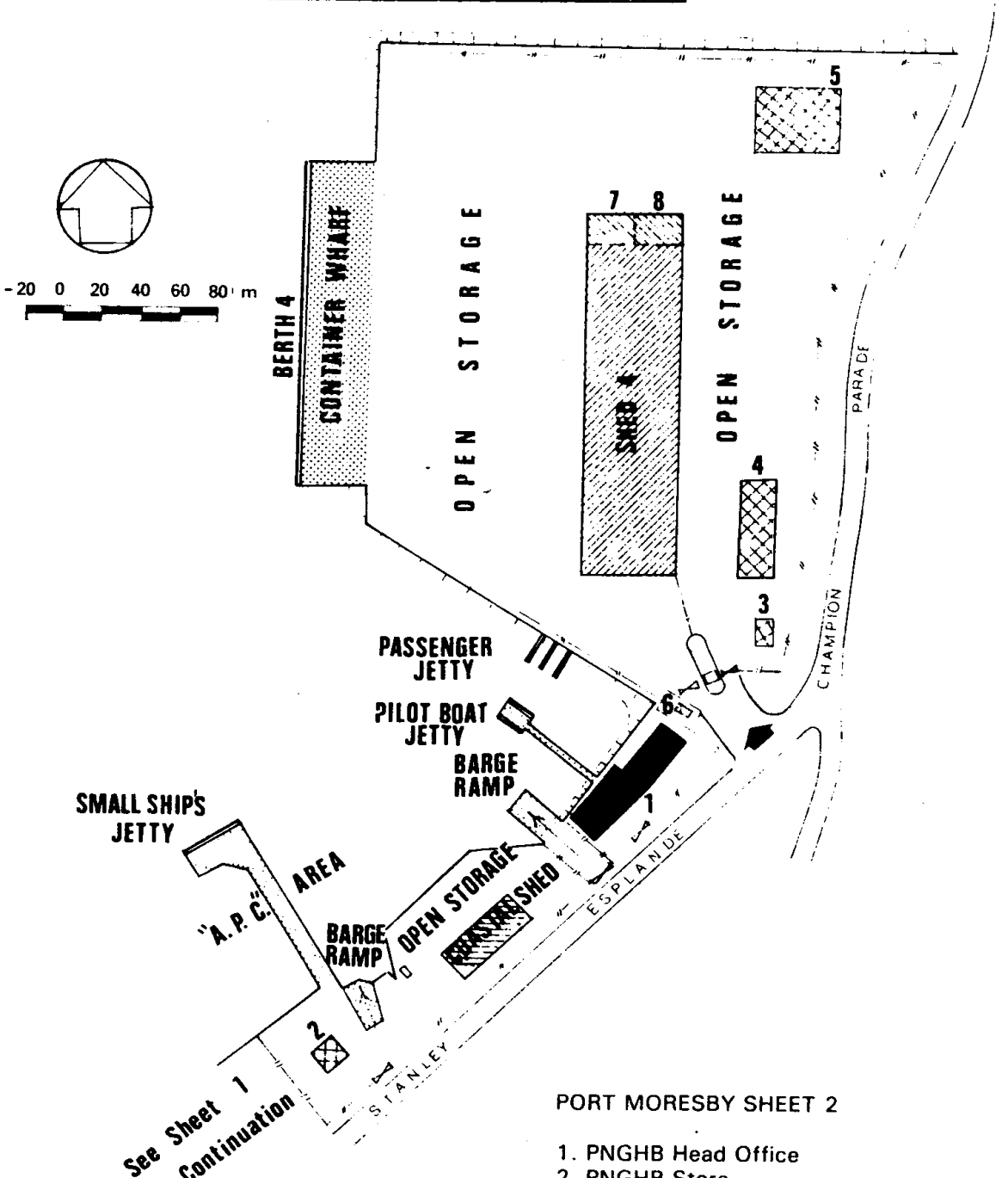

PORT MORESBY SHEET 1

1. Port Manager's Office
2. Port Maintenance Workshop
3. Port Security Office
4. Labour Allocation Area
5. Stevedores' Ablutions
6. Stevedores' Mess
7. Tug Operators' Offices

Source: "Handbook of Information", PNG Harbours Board, 1982.

# PORT MORESBY Sheet 2




PORT MORESBY SHEET 2

1. PNGHB Head Office
2. PNGHB Store
3. Stevedores' Ablutions
4. Stevedores' Mess
5. Stevedores' Workshop
6. Passengers' Ablutions
7. Stevedores' Office
8. Customs' & Agents' Offices

Source: "Handbook of Information", PNG Harbours Board, 1982.

**The Port of Rabaul**

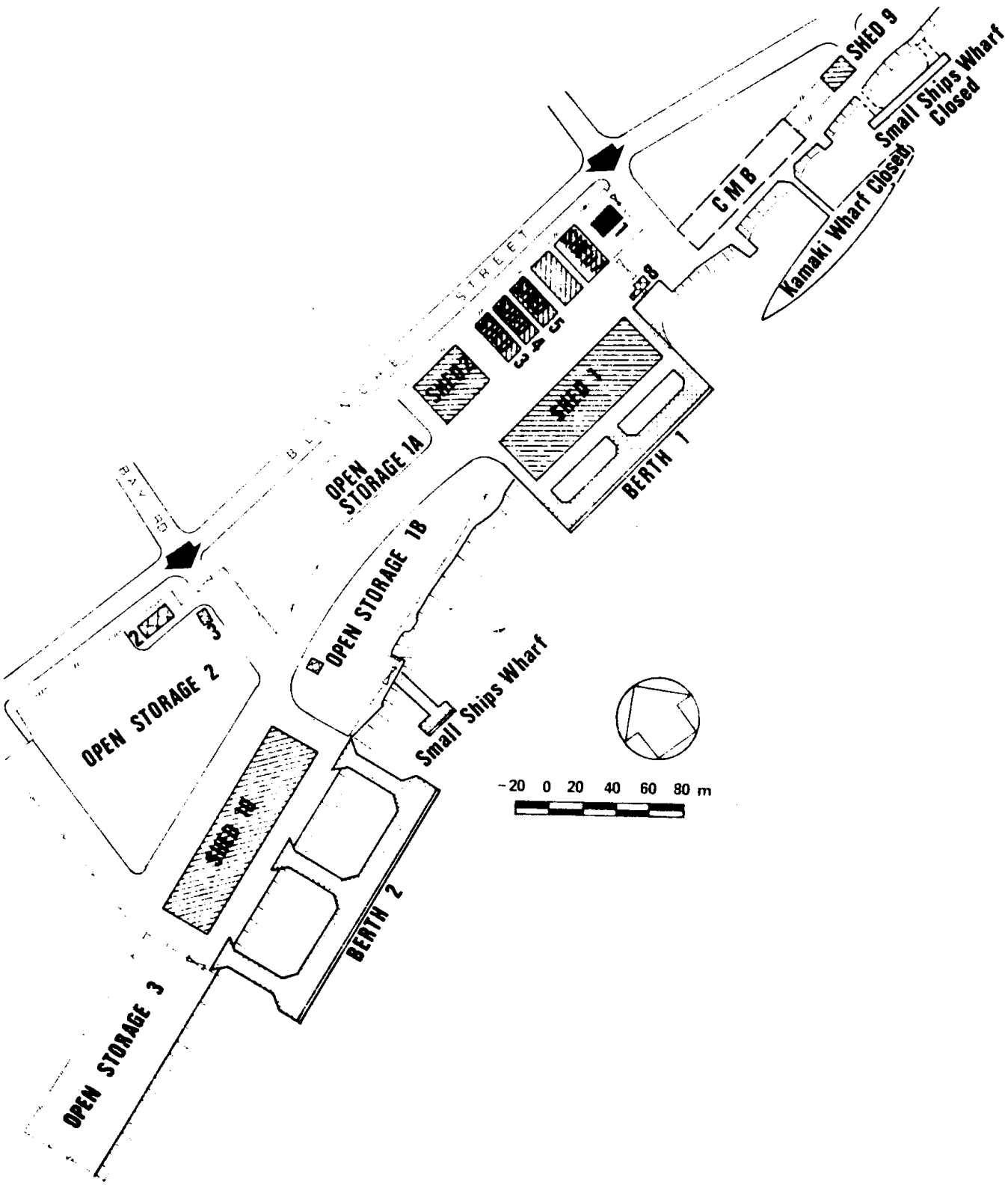
The Harbours Board facilities at the port of Rabaul consist of two berths, of the 'fishpond' type with sheds immediately behind them. Containers are usually handled on No. 2 berth using a tractor-trailer system, although No. 1 is sometimes used for ships whose gear is too small to reach over the wide fenders on berth one. Open storage area 2 is used as the container park with unstuffing immediately behind the shed, empties stacked on the left, and FCL containers at the back of the berth. The area is small, but more than adequate for present very low throughputs of no more than 200 boxes a month. And if a high degree of containerisation developed, more space could be found in open storage areas 1 and 3 and ultimately in the removal of the shed on berth 2. The central facility handles all overseas ships, plus the Shipping Corporation and Consort coastal services. The small ships wharf between berths 1 and 2 and the facilities to the right of No. 1 berth have fallen into disrepair and been closed. Coastal Shipping and Burns Philp each has its own facilities in other parts of the harbour.

The Coastal Shipping Company facility is a moderately large one capable of accomodating all the fleet at one time. The ships come alongside a number of small jetties, and there are also shore ramps to meet the bow doors of the landing craft type vessels, so that they can be worked simultaneously alongside and through the bow. There is also an adequate transit area with a shed and open storage space. Burns Philp operate through a similar though smaller facility whilst the Pacific New Guinea passenger line has a small jetty.

There is a long established tradition at Rabaul, that passenger ships, particularly the Lae boats, leave on a Tuesday. This goes back some twenty years and is accepted as a fact of life, rather like the need to provide weekly frequencies in liner trades. Whether this could be changed or not is difficult to say but the effect is that the freight services which also carry some passengers depart on Tuesdays. In fact all of Coastal's services tend to follow this pattern, the ships returning over the week-end for this Tuesday departure.

Both Coastal Shipping and Burns Philp prefer to operate their own facilities. This gives them the flexibility they need, and holds down costs; and at Rabaul there is the added dimension relating to the bunching of the coastal services. The independence of these two lines is a well established feature of operations at Rabaul and in fact the Harbours Board does not even have the physical facilities to accommodate them.

# RABAUL




**RABAUL**

1. Port Manager's Office
2. Stevedores' Amenities
3. Security Office
4. Main Gate House
5. Security Training School

Source: "Handbook of Information", PNG Harbours Board, 1982.

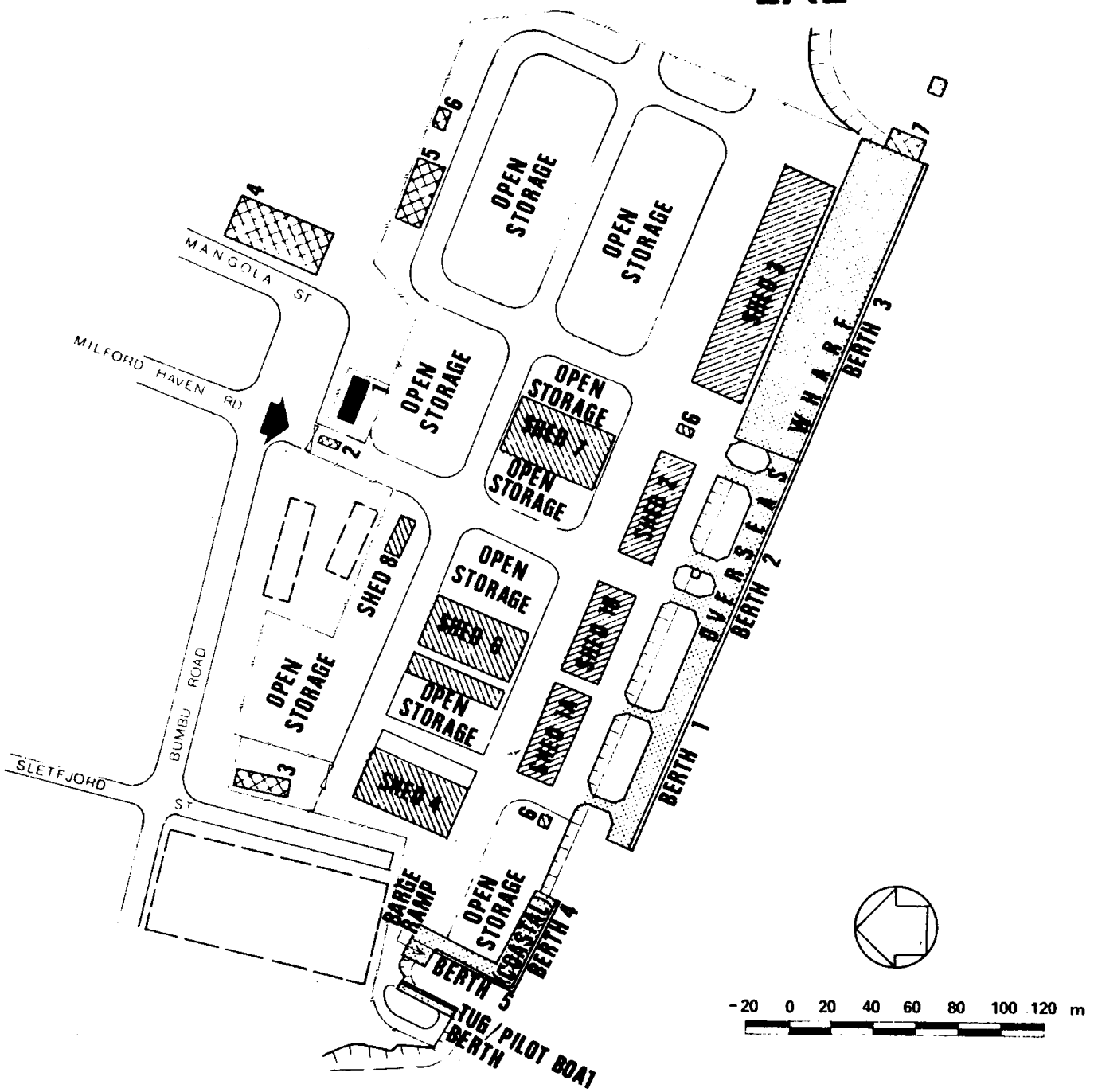
**The Port of Lae**

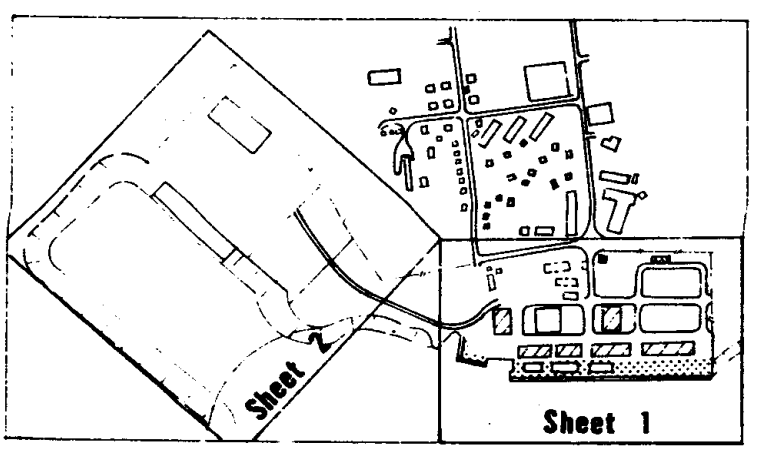
Lae is the largest port within the Harbours Board system and the facility consists of four berths. Number 1 is a small coastal berth at which Consort operate, utilising the area behind the berth and also shed No. 4. Lutheran also operates a small independent facility nearby. Nos. 2 and 3 are two conventional overseas wharfs of the fishpond type with a number of small sheds and open storage areas behind them. These are not capable of container operations with F.E.L. trucks on the wharf, neither are they ideal for general cargo, because of the relatively long distance from the quay to sheds, the narrow approaches across the fishponds, and the small sizes of the sheds and open storage areas. Number 4 is the most modern wharf being the best facility both for general cargo and containers. Sometimes container ships are worked from the quay to a stack in front of the shed, which gives very fast handling. If this is not possible containers have to be moved by tractor trailer to the large open storage area behind the shed. The shed on No. 3 berth is also of a good size and well located for general cargo.

There was a scheme for development of a new container terminal at Lae, to get around a swell problem which hampers operations at some times in the year. This would have been enormously costly, and was eventually abandoned following land problems, after substantial costs had already been incurred in mobilising dredgers. However, the existing No. 3 berth at Lae could be redeveloped to provide a large container throughout, in excess of 30,000 TEUs per annum, if traffic grew, whilst Nos. 1 and 2 could be redeveloped for conventional facilities by covering the fishponds and providing more suitable shed space. Plans for redevelopment at Lae are likely to be formulated later this year.

The detail of this plan will also be affected by possible containerisation of the coastal trade but there ought to be no long term danger of inadequacy of facilities.

# LAE




LAE SHEET 1

1. Port Manager's Office
2. Gate House & Security
3. Port Maintenance Workshop
4. *PNGHB Training School*
5. Stevedores' Amenities
6. Ablution Blocks
7. Oil Loading/Discharging Facility

Source: "Handbook of Information", PNG Harbours Board, 1982.

## 3. THE QUESTION OF JURISDICTION

One of the issues which has arisen recently concerns the fact, that some coastal facilities lie completely outside the Harbours Board system. The Harbours Board it is believed would like to extend its jurisdiction, whilst coastal operators are wary of this, and point to the fact that facilities under their own control are cheaper and more convenient.

This issue breaks down into two sections, first, control and responsibility for the provision of facilities, together with conservancy, navigation, etc. and second, the control of stevedoring and rules on operating practice.

### Provision of Facilities and Conservancy

There is a very great deal of variety in the world in the nature of the precise roles undertaken by port authorities, but the basic ones are the provision of facilities, i.e. sea access; berth, transit and storage areas, and land access, and the control of movements to and from them. A number of major ports confine themselves largely to these activities and this includes, some of the major ports of Continental Europe, e.g. Rotterdam, as well as some of the large ports of North America. This also applied to many of the major ports of the United Kingdom until the late 1960's and early 1970's when they were forced to move into stevedoring on a large scale, a development which caused them great trouble and expense in the late 1970's. Many of the landlord ports have, however, been highly successful, in port development, traffic control and navigation, and urban links, including in some cases re-development. There is an obvious logic to this model in that the issues involved in developing the facilities of a port are inter-related and benefit from co-ordination in planning. Navigation also requires the operation of universal rules.

**Operations**

In the case of cargo handling operations, the position is quite different from that relating to development. Here one of the main features is that of diversity in the detail of operational needs. For example in the case of present coastwise shipping in PapuaNew Guinea, there are individual needs with respect to the pre-receiving of cargo, allocation of berths to vessels, and storage. If the coastal facilities are separate, there is absolutely no reason why these needs should not be met and the simplest way to achieve this is by a leasing arrangement which allows coastal operators to do their own thing. If on the other hand the facilities have to be joint, as might well be the case with a containerised operation, then it would probably be necessary to have unified berth control and stevedoring, although coastal operators could retain a degree of independence by operating container freight stations and feeding all their boxes through the container system as FCL's.

Further to this if a coastwise container system is to work effectively, and particularly if it is to tranship deep sea boxes it will certainly require good berth availability, a function partly of scheduling and berth reservation schemes and partly of berth occupancy ratios which are appropriate and will accomodate some of the variability which occurs even in scheduled arrival patterns.

## 4. STEVEDORING

The stevedoring sector is another which can be dealt with only briefly in this report, and is one which is also under consideration for an individual study next year. Two aspects of this can be distinguished, one concerned with labour and the unions, and the other with the structure of the industry itself.

Some ten years ago in Papua New Guinea stevedoring and cargo handling was cheap by international standards. Today it is very much more expensive and shows every sign of further escalation.

**Labour**

The traditional method of employment in Papua New Guinea is for the use of village gangs, employed on a rotational basis, with each gang working only a relatively small proportion of the total working year. In the circumstance of Papua New Guinea this had a number of advantages. Stevedoring wages were spread around the community rather than being concentrated in the hands of a relatively privileged few, whilst discipline was achieved through the normal social structure of the village, and there were relatively few problems on the waterfront. The system was apparently liked both by the stevedoring companies and the workers. Large elements of this system remain in Papua New Guinea, even in the major ports, Rabaul still uses the village gang system whilst Lae has a mixed system, with each of the three stevedoring companies having a core of some 70 permanent employees, and drawing on a roster of up to 600 employed in village gangs for a month at a time, according to requirements.

Port Moresby, however, has a different system with a permanent workforce which receives fall back pay when there is no activity. There is also a system by which ordinary time is paid for just one shift per day, with anything beyond that becoming overtime. This applies to all ports.

Over the last ten years at Port Moresby, under a strong influence from the Australian waterfront, there has been frequent use of the strike weapon. Stevedoring wages have gone up substantially, setting an inflationary pace for the economy as a whole, and in Port Moresby in particular, the standard of performance is said to have declined substantially. In the other ports the increase in wages has not been associated with a similar decline in performance.

The approach of the Moresby led union appears to be to increase its membership across the transport industries, (it already includes seamen as well as stevedores and there was a recent move to add truck drivers), so as to bring the maximum possible leverage to bear in every case. Following a wage increase of almost 50 percent last year there has been a lull in union activity, but this would appear to be only a temporary respite in what is clearly a very hard line approach. One of

the recent features of this approach is an attempt now to work on benefits, housing and transport, etc.. In the early days the provision of accommodation and transport was required in many areas to allow the mobilisation of the work force, but accommodation in particular was only basic. The move now is to aim for higher standards of housing, the costs of which would be enormous.

The transplanting of the Australian waterfront tradition to Papua New Guinea is very much to be regretted. The Australian waterfront is one of the most expensive in the world, both in terms of direct costs and also slow ship turnaround, delays and dislocation generally. It is bad enough in Australia and a disaster for Papua New Guinea.

The labour situation of the Papua New Guinea waterfront needs to be handled with extreme care. First and most important it is essential that it remain private sector. Any move on the part of the Harbours Board or a public sector company into the industry, either in a search for short term profits, or because the private sector became unwilling to sustain increasing demands and responsibilities would exacerbate all present problems and tie a millstone round the neck of the Harbours Board or any public sector stevedoring company of the type that has caused such severe difficulties in the United Kingdom. Second, the village gang system should be retained as far as is practical, both to help in efficiency of operation, and also because of its social advantages. Third, efforts should be made to see that the rapid escalation of stevedoring costs is contained.

The recovery of lost ground and adjustment required to deal with modern technology is an entirely different matter. This has been a long and difficult process in many parts of the world and will probably prove to be so in Papua New Guinea.

**Industry Structure**

The question of industry structure concerns the number of stevedoring companies in the ports and aspects of their mode of operation. It has already been recommended that the industry remain private sector rather than public, and that the coastal wharves be allowed as far as is practicable to operate independently of the overseas facilities.

Most of the larger ports have a number of stevedores, whilst the smaller ones will often sustain only one company. There has been some move towards amalgamation in Port Moresby with the formation of Port Services to operate the container berth. The logic behind this was that there was only a small throughput, and it would be excessively wasteful for independent stevedores each to own their own equipment. In this case and in others where throughputs are small in relation to the scale of operation and the capacity of a minimum park of handling equipment, there may have to be some form of monopoly or at least of co-ordination in equipment usage. However, apart from this it is probably the case that the needs of the country and indeed of the stevedores themselves will best be served by retaining a competitive structure.

# CHAPTER 7 - SUMMARY AND CONCLUSIONS

The review of traffic in Chapter 1 isolated three levels. First, there are the four main ports - Moresby, Rabaul, Lae and Kieta, and others which fit at least reasonably closely into a route pattern which serves them, Alotau, Oro Bay, Madang, and possibly Wewak, Kavieng and Kimbe at reduced frequencies. Then there are the rest of the main ports and finally the third level feeder main port flows, which are chiefly to the Gulf and the West. The key problem in the coastal sector is in the first level main port trades, where traffic was some 200,000 revenue tonnes per annum in 1981. The feeder main port trades are almost as large, some 150,000 revenue tonnes moving in 1981, (including 54,000 to and from Moresby and 57,000 to and from Rabaul), but they represent fairly self-contained systems and the issues are not so acute. There is no very strong growth trend, except for project cargoes like Ok Tedi, but given the nature of traffic generating forces some variability is to be expected.

There are three main companies serving the key main port trades, PNG Shipping Corporation, Consort Express Line and Coastal Shipping. Lutheran also operate on a fair scale although concentrating on the New Guinea coast, whilst Poroman operates on a small scale and the project cargo cum tramp operator Morehead makes occasional incursions into the trade. Steamships and Burns Philp operate the trade to the Gulf and the West, whilst Burns Philp and Coastal concentrate on the Rabaul area, the latter including Lae in its operations.

In the main port trades conventional/pallet operations have made considerable progress and have recently demonstrated viability of the operation. The Shipping Corporation, now operating under a scheme of arrangement, introduced containers some years ago but owing to its earlier poor management in both coastal and overseas trades, incurred heavy losses. Meanwhile Coastal Shipping Co. and Lutheran concentrating on the short high freight rate sector on the north New Guinea coast and between New Guinea and the islands, have also apparently been viable. Thus there are at the moment a number of alternative strategies on the coast, both in terms of choice of technology and also in respect of route structure and operating pattern.

In reviewing this demand and supply position on the core main trades, a case emerged for a service operated with relatively large multi-purpose coasters of modern design, three or four of which could provide a weekly frequency around the main port circuit discussed in Chapters 2 and 3. Such ships would have substantial size economies compared to many of the smaller ships presently operating and as well as sustaining a weekly frequency on major sectors, would offer services of reduced frequencies to some of the outlying areas. Further, although at the moment there appears to be a polarisation between pallet and container proponents, modern multi-purpose ships could accommodate both systems although this would involve a transfer of some cargoes from coastal to Harbours Board facilities. There is now evidence of strong shipper demand for containers, whilst some savings in stevedoring costs are available for FCLs. These are not as great as they should be, however, and there is no significant saving in LCL container operations, compared to the use of shrink wrapped pallets.

Looking at the present fleet, many of the conventional ships are rather small, whilst the container ships being of intermediate design, have only moderate container capacities in relation to their dimensions and costs. Presently there are about eleven ships of a variety of types and capacities on the route and it is substantially overtonnaged. However, in rationalising with new ships timing is very important, so that existing tonnage can be disposed of and new ships obtained, (perhaps in the second hand market) as economically as possible. The introduction of efficient new ships should reduce the role of some of the smaller vessels in main port trades. These are presently sustained partly by the relatively favourable rates on short sectors.

Freight rates are undoubtedly high in the coastal trades, relative to deep sea rates. There are partial explanations for this in a very small ship size, poor cargo balance on some sectors and high unit costs, in fuel and repairs and maintenance for example. But some of it is due to overtonnaging and certain inefficiencies in existing operations, the effect of this being magnified by the fact that the cost base is so high. The system of rate negotiation appears to allow lines to cover overtonnaging. Cargo handling and port costs are now also very high representing as much as one third of the total between port gates.

The aspect of regulation dealt with in this report is capacity licensing not the ship registration which has been an undoubted success in removing poor tonnage. The Merchant Shipping Act under which licences are granted in the coastal trades, gives enormous power to the Minister for Transport, although this is partly modified by other ministries like Finance. There is also an advisory body, the Coasting Trade Committee (but this is not always consulted and even if consulted may have its recommendations ignored). Finally there is the possibility of 'judicial review of administrative action', which may be brought to bear to constrain ministerial powers.

In the last few years the licensing system has not worked effectively, in fact it may have been a positive cause of overtonnaging, in terms of the 'ratchet' effect described in the literature on maritime economics. Present pricing structures may also encourage overtonnaging. The system has not appeared to be objective or be working to a blueprint or strategy for efficient operations, whilst the sudden and arbitrary rescindment of licences has been an aberration blocked by the courts. Further to this every competitive move within the system becomes distorted by the need for ministerial approval. This is partly a political distortion and partly because the lines themselves come to see political influence to be at least as important as the right strategy and efficiency in operations. This is not necessarily to criticise individuals or lines it is almost an inevitable result of the nature of the system within which they operate. The position could be improved if the Minister, whilst retaining the control given by the licensing system could step back from the detail of every move and encourage the industry to develop an efficient blueprint for medium term future which would meet national objectives with respect to efficiency, costs, freight rates and the breadth of the system. There is a model for this in the Australian Government's encouragement of rationalising approach by the lines to the trade with North West Europe. This is combined with encouragement of Shippers' Councils. It would also be possible to amend the Act so as to limit ministerial power somewhat and establish criteria for ministerial decisions. The case for retaining ministerial control lies in the fact that the system is a very small one which will sustain only one or possibly two services and would be easily unbalanced by competition.

However, the recommendation of this study is more radical than that. It is for a move towards de-regulation, in which the Minister would have only fall-back powers to restrict entry. The lines would be allowed to form a pool if they wished and offer dual rate contracts, whilst a Shippers' Council could also be formed to negotiate rates and deal with matters of service quality. However, without licensing as a barrier to entry high service quality and low cost would be the deterrent and if the pool could not meet shippers' needs an outsider could always enter the trade. There is, however, a case for protecting the industry from international container services, except where they can clean up economically at the fringes of the system. This lies in the fact that international services are not precisely compatible with domestic needs, as well as being subject to changes and shocks in other parts of the system. Their priorities would of course always be with their overall network rather than the small coastal component in Papua New Guinea. The industry would also need to be protected from outside Flags if it is to survive.

**The Port Sector**

The review of the port sector has necessarily been rather brief. In general facilities are adequate although there are some local difficulties particularly at Port Moresby. Although port planning and development may need in many cases to be controlled through the Master Plans of the Harbours Board, there is a strong case for allowing coastal operators as much independence as possible. This arises from the fact that they clearly need flexibility in planning their operations, whilst the requirements for control of non-bonded cargoes are genuinely much reduced compared with overseas traffic. For this reason it is recommended that where possible coastal operators be allowed to use their own wharves and sheds or lease them from the Harbours Board. Even where this is not possible because of joint use of a berth, an attempt should be made to provide sheds solely for the use of coastal trades. Containerisation of coastal cargoes would, however, inevitably bring a larger proportion of the trade over Harbours Board facilities.

On the labour front there has been a move towards an Australian style union which has led to a rapid escalation of costs, including an increase in wages of almost 50 percent within the last eighteen months. There are also some pointers to the possible spread of the Port Moresby system and the further escalation of wages and benefits. This would lead to substantial increases in the already high cost of cargo handling, and should be resisted.

The industry should also be kept out of the public sector and remain (as far as possible in the circumstances of each individual port) competitive.

## LIST OF PERSONS INTERVIEWED

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C. Smith, Burns Philp (PNG) Ltd.
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A. Fenske, Lutheran Shipping
J. Cunningham, Morehead Shipping Pty. Ltd.
B. Flynn, South Pacific Brewery Ltd.
J. Young, A.C.I. New Guinea Containers Pty. Ltd.
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J. Millett, Balance Pty. Ltd.
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H. Chow, Coastal Shipping Company Co. Pty. Ltd.
D. Grimmer, Port Manager, Rabaul
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J. Batagye, Department of Finance
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P. Sharp, Pacific New Guinea Line
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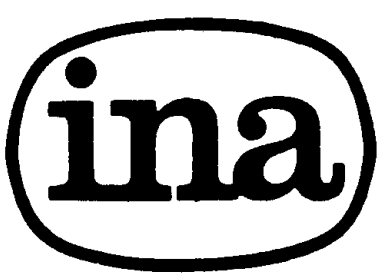
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