

NATIONAL TRANSPORT RESEARCH CENTRE
PLANNING AND DEVELOPMENT DIVISION
GOVERNMENT OF PAKISTAN

PAKISTAN MARITIME TRANSPORT
PROGRESS REPORT
PMT-1/77

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PAKISTAN'S SEABORNE CARGOES

Pakistan's seatriade can be divided in the following categories :

1. General Cargoes in liner-vessels
2. (Semi-) bulk cargoes in trampers (wheat, rice, cement, fertilizers, phosphates).
3. Dry-bulk cargoes for Karachi Steelmill, which will start moving in 1978, in bulk-carriers (ore, coal and coke).
4. Liquid-bulk cargoes in tankers
5. Passengers, travelling on passenger ships on ferries

In Figure 1, on page 2, a forecast is given of the volume of the first four categories for the next 15 years (figures based on draft outline Fifth Plan 1977-83).

Figure 2, on page 3, gives a comparison of the relative volume of these categories.

For 1983 these figures are :

Liquid-bulk cargoes	33%
Dry-bulk (non steelmill)	26%
General cargoes	23%
Dry-bulk (Steelmill)	18%
	<hr/>
	100%

Figure 3, on page 3, gives a comparison of the relative seafreight payable for these categories.

For 1983 these figures are :

General cargoes	66%
Dry-bulk (non-steelmill)	24%
Dry-bulk (steelmill)	6%
Liquid-bulk cargoes	4%
	<hr/>
	100%

In computing these figures it is assumed that there will be no change in the ratio between the freight rates for the different types of cargo. The freight rates used for 1976 are :

General Cargo	US \$ 63. - per ton
Dry-bulk (non-steelmill)	" " 20. - " "
Dry-bulk (steelmill)	" " 7. - " "
Liquid-bulk	" " 2.60 " "

FIGURE 1

TRAFFIC FORECAST - PAKISTAN SEABORNE TRADE PROJECTIONS 1976 - 1991

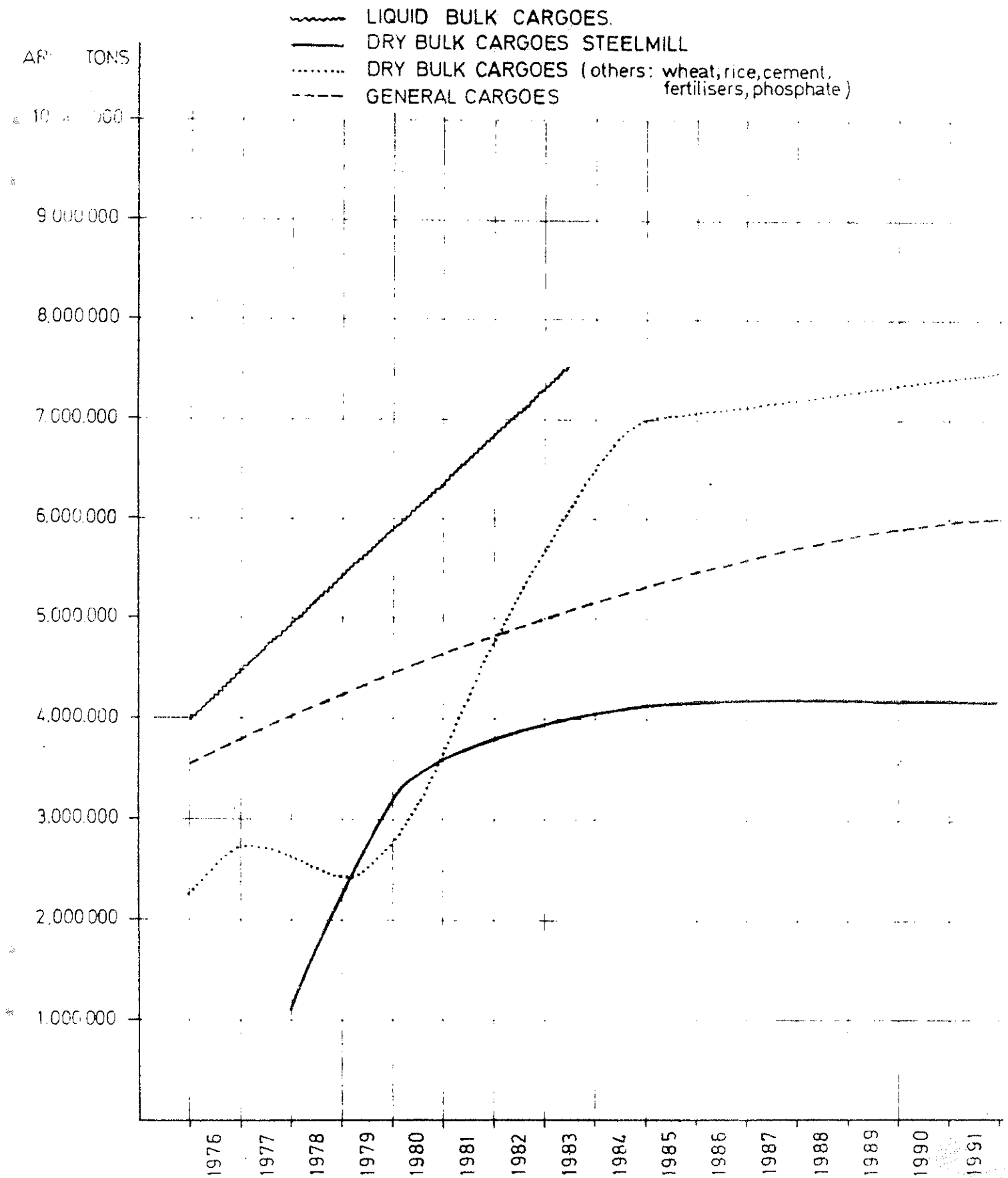


Figure 2

VOLUME PERCENTAGE OF THE DIFFERENT TYPES OF MARITIME CARGOES

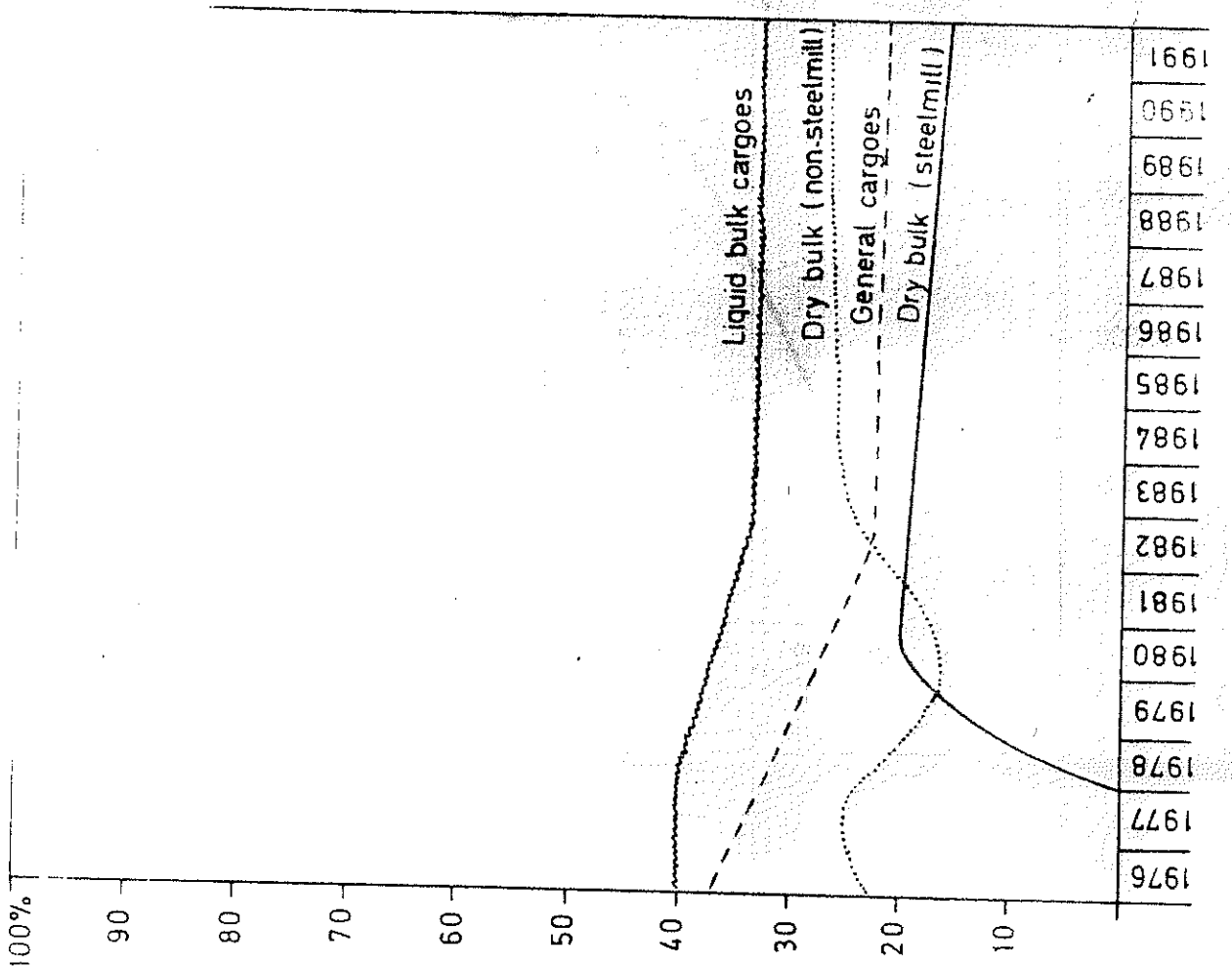
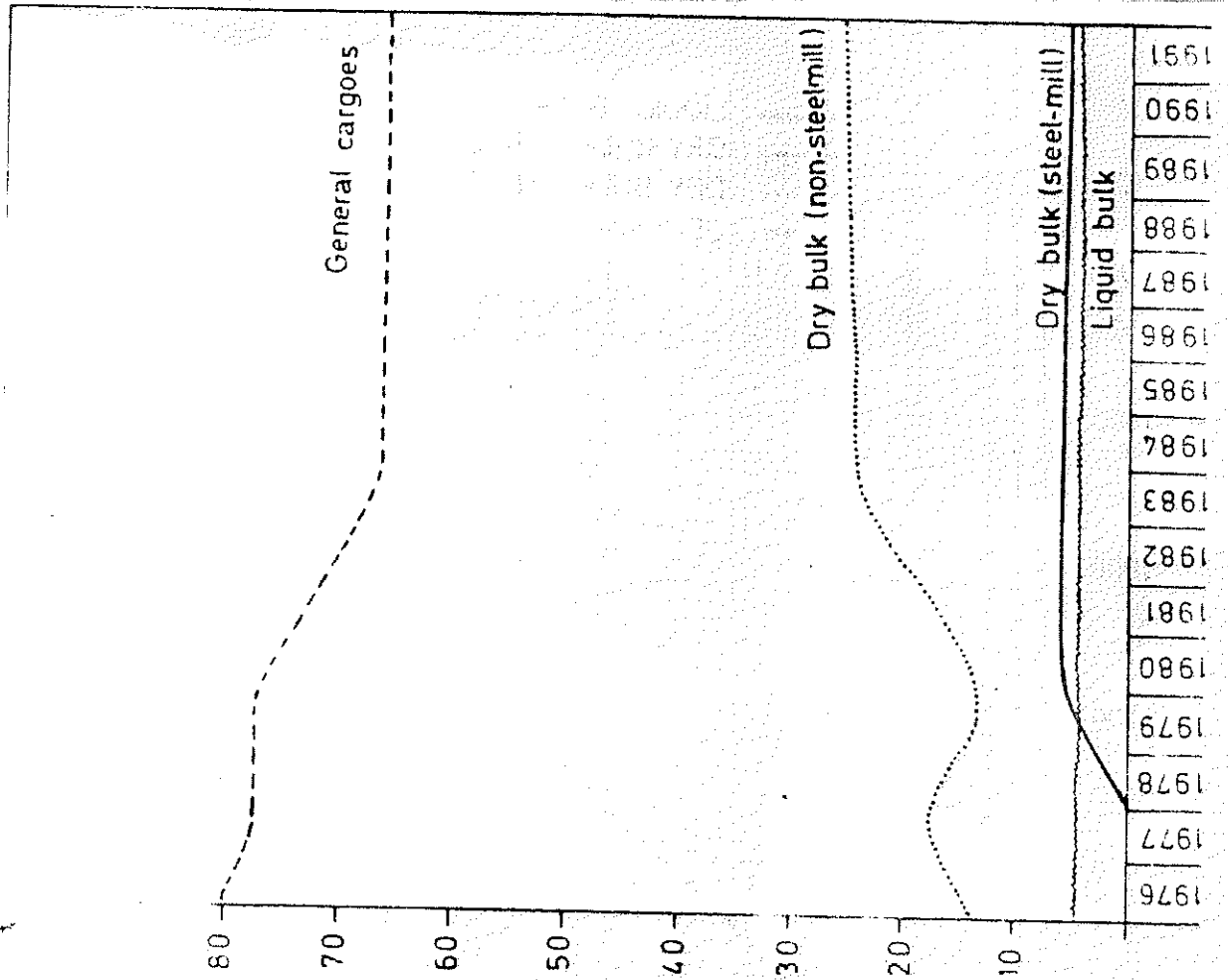


Figure 3

SEAFREIGHT PERCENTAGE OF THE DIFFERENT TYPES OF MARITIME CARGOES



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PAKISTAN'S MERCHANT FLEET

Figure 4, on page 5, gives the size in DWT of the merchant fleet from 1947 - 1976.

The Third Plan (1965-1970) envisaged to increase the number of ships from 52 to 98 and according to the Fourth Plan the fleet strength should be increased to 123 ships with 1,300,000 DWT.

In fact in 1976 the fleet consisted of 48 ships with 596,000 DWT, (the same tonnage as in 1966), with a capacity potential to carry about 25% of Pakistan's seaborne trade.

The average size of the general cargo vessels grow steadily as follows :

7.000 DWT	in	1947
8.000	"	1966
9.000	"	1963
10.000	"	1967
11.000	"	1971
12.000	"	1976

and is expected to reach about 15.000 DWT in 1991. At that time the tankers and bulk-carriers will be in the 40 - 80.000 DWT - range.

The average age of the vessels is 15 years. Based on an economic life-time of 20 years this should not be more than 10 years. Moreover the age distribution is unfavourable, as can be seen from figure 5, on page 5. Only 3 vessels are less than 9 years old.

The average speed of the vessels was only 12.3 knots and the technical delays were considerable (average one month per year for repairs and dry-docking).

Together with cargo handling and port delays (mainly in Karachi) this resulted in a performance of less than 3 tons cargo per DWT per year, which is little more than half the world-average.

The up-grading of the fleet and its performance requires a long-term development plan, which is outlined on the following pages for the different categories of ships.

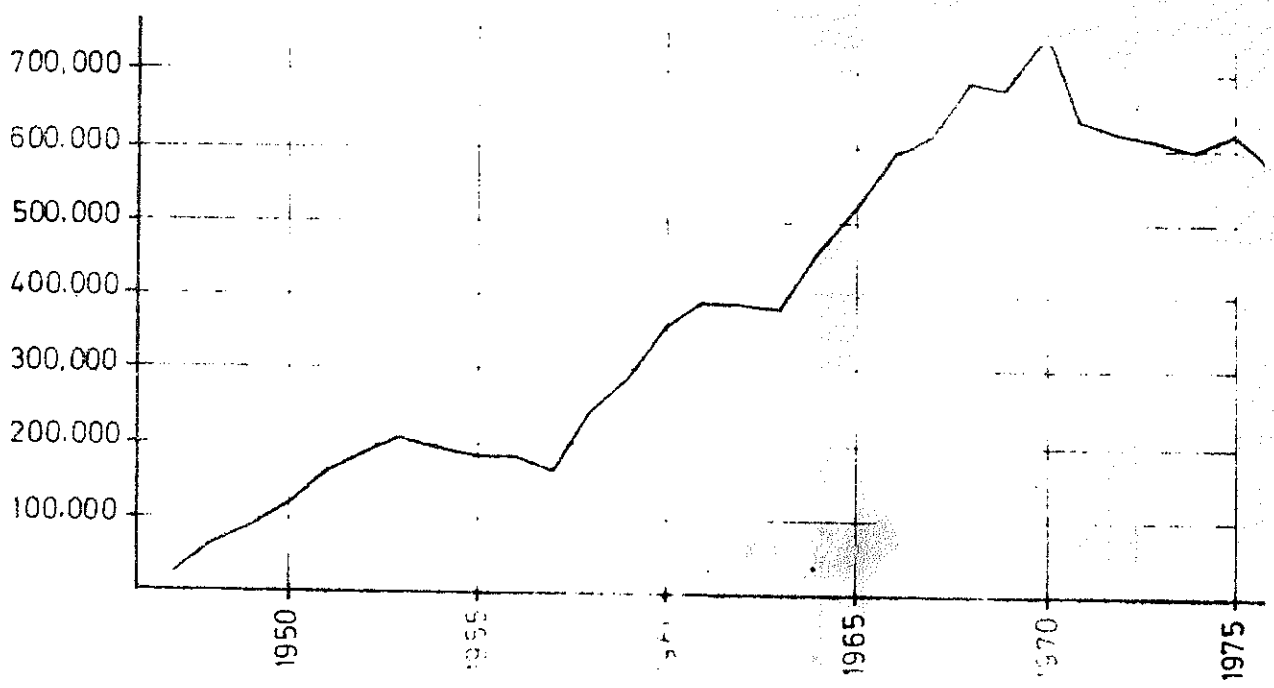
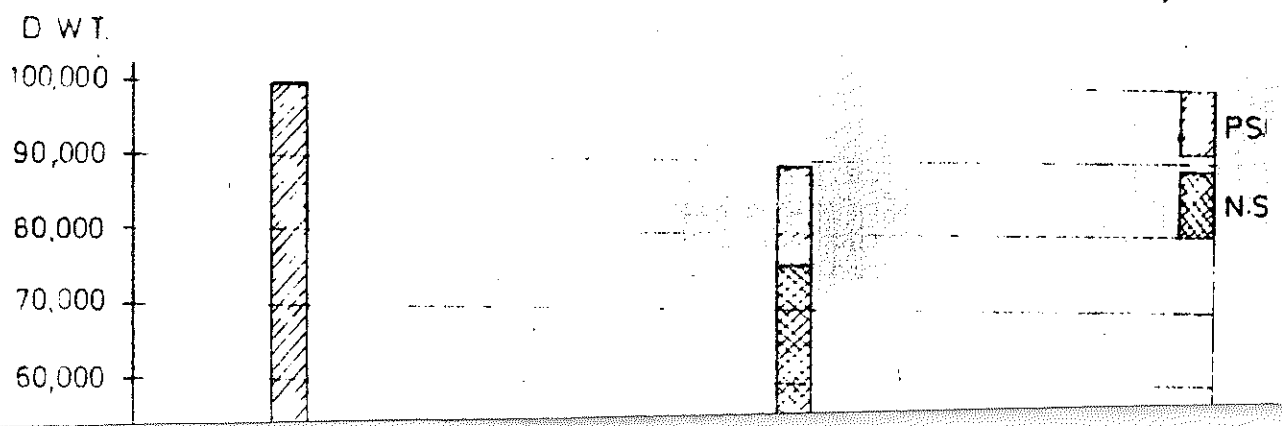


FIGURE 5

AGE DISTRIBUTION GENERAL CARGO SHIPS
PAKISTAN FLEET



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GENERAL CARGO IN LINER VESSELS

Most of the 46 general cargo ships of Pakistan's fleet are presently operating in the liner services of N.S.C. and P.S.C.

Table A, on page 7, gives some figures from an analysis of 75 liner voyages performed by N.S.C. vessels during 1975/76 on the three liner routes to Europe, North America and Far East.

At a performance of 2.9 tons cargo per DWT per year the average freight rate of US \$ 68.- per ton cargo is not enough to cover the cost of sea-transport which includes provision for adequate replacement of the fleet.

To break-even a performance of at least 4 tons cargo per DWT per year is required.

The average service speed is only 12.3 knots and 10 days per year are lost on repairs and dry-docking, (For P.S.C. vessels, with an average age of 16 years this is 40 days per year). The older vessels are also not suitable for modern cargo handling methods. Berthing delays (mainly in Karachi account for more than 15% of total voyage time, and once vessels are at the quay an impaired organization of the cargo flow further prolongs port-stay.

The main task for the coming years will be to improve the performance from 2.9 in 1976 to 4.3 in 1983 and to 5.8 in 1991 through an accelerated modernization programme.

Table B, on page 8, gives a projection of the performance from 1976-81. It shows the effect of an increase in service need from 12.3 knots to 15.3 knots through re-juvenation of the fleet.

The pay-load percentage is expected to improve from 70% to 77.5% mainly as a result of the utilization of additional cargo space on deck with the introduction of containers.

The volume of cargo handled per day will be increasing from 476 to 1000 tons through improved cargo-handling organization and equipment and unitization of cargo (pallets, containers).

The various delays, expressed in a percentage of the cargo-handling time will be reduced with a younger fleet, better scheduling and less congestion.

Figure 6, on page 8, gives the performance of the N.S.C. liner fleet over the past 8 years and the projected performance over the next 15 years in accordance with column 11 of Table B.

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TABLE A.

ANALYSIS OF 75 VOYAGES MADE BY N.S.C. SHIPS
ON THREE LINER ROUTES IN 1975 / 1976.

(Average figures)

	UK/CONT LINE	U.S./CAN. LINE	FOR EAST LINE	AVERAGE N.S.C.				
DWT of ships employed	12.900 DWT	12.700 DWT	10.900 DWT	12.200 DWT				
Distance Round Trip	15.000 ' "	22.000 ' "	14.000 ' "	17.000 ' "				
Cargo outward voyage	7.400	5.310	7.400	6.700				
Cargo homeward voyage	10.450	6.960	11.420	10.300				
Cargo per Round Trip	17.850	14.270	18.820	17.000				
Pay Load per Round Trip	69,2%	56,2%	86,3%	69,7%				
Freight per ton outward	\$ 43,00	\$ 51,30	\$ 21,60	\$ 38,60				
Freight per ton homeward	\$ 72,10	\$ 113,00	\$ 49,00	\$ 78,00				
Freight per ton average	\$ 60,00	\$ 90,00	\$ 38,20	\$ 68,00				
Cargo-handling per day OW	490	456	560	500				
Cargo-handling per day HW	500	360	497	460				
Cargo-handling per day	495	405	520	475				
	Days	%	Days	%	Days	%	Days	%
At sea	51,2	29,6	74,2	37,5	47,1	31,00	57,5	33,0
Loading & discharging	71,6	41,4	70,5	35,5	72,5	47,7	71,5	41,0
Berthing delays	25,2	14,5	30,5	15,4	24,4	16,1	26,7	15,3
All other delays	25,0	14,5	22,8	11,6	8,0	5,2	18,6	10,7
Round trip duration	173,0	100,0	198,0	100,0	152,0	100,0	174,3	100,0
No. of Round Trips per year	2,08	-	1,82	-	2,32	-	2,07	-
No. of voyages per year	4.16	-	3.65	-	4.64	-	4.14	-
Performance per DWT per year								
- in cargo-tons	2,90	2,05	4,09		2,90			
	21,750	22,550	28,630		24,006			

TABLE - 8

PROJECTED PERFORMANCE OF PAKISTAN'S LINER FLEET 1976-1991

(based on actual figures NSC 1976, average route-Length 8500 mile)

Year	average speed in knots	days at sea	payload perc. od D.W.T.	cargo hand-ling p.day	cargo hand-ling days	delay time % of 6	delay days	voyage dura-tion (days)	nr.of voyag-es per year	Perfor-mance (4x10)
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1976	12.3	28.8	70.0	500	35.4	65	23.0	87.2	4.13	2.9
77	12.5		70.5	510		63				3.1
78	12.7		71.0	600		61				3.3
79	12.9		71.5	650		59				3.5
80	13.1		72.0	700		57				3.7
81	13.3		72.5	750		55				3.9
82	13.5		73.0	800		53				4.1
1983	13.7	25.9	73.5	850	24.0	51	12.1	62.0	5.81	4.3
84	13.9		74.0	900		49				4.5
85	14.1		74.5	950		47				4.7
86	14.3		75.0	1000		45				4.9
87	14.5		75.5	1050		43				5.1
88	14.7		76.0	1100		41				5.3
89	14.9		76.5	1150		39				5.5
90	15.1		77.0	1200		37				5.7
1991	15.3	23.1	77.5	1250	18.6	35	6.5	48.2	7.47	5.8

TABLE - C

PROJECTED CAPACITY OF PAKISTAN'S LINER FLEET 1976 - 1991

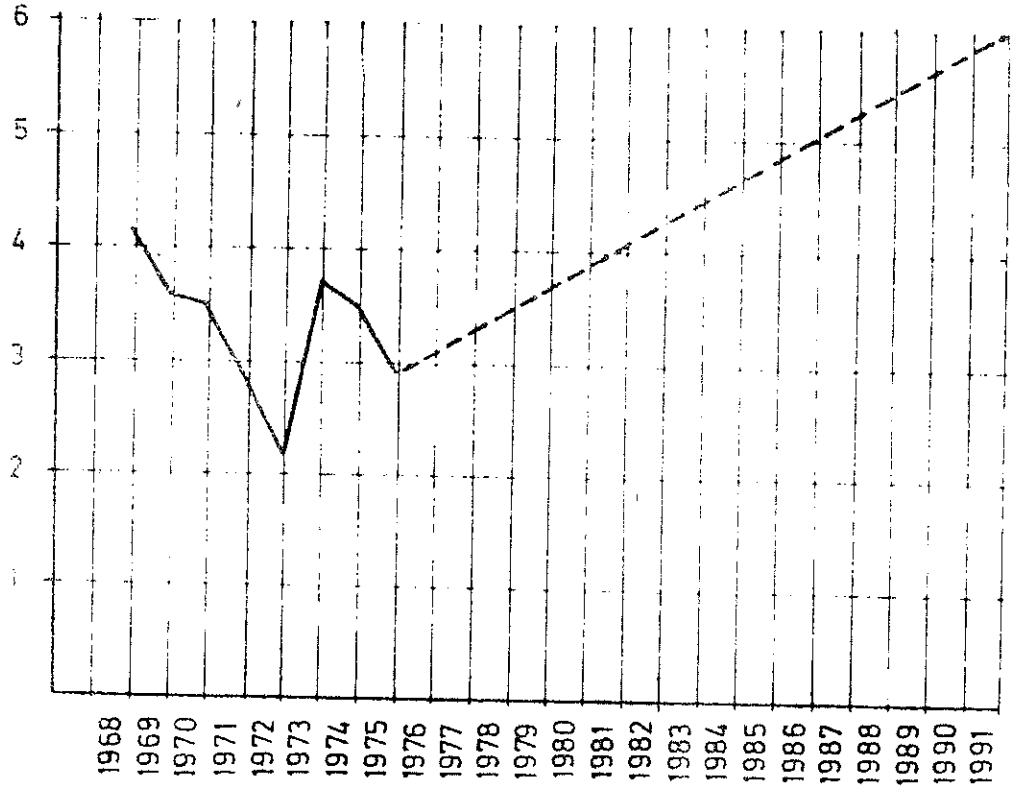
Year	No. of ships	Total D.W.T.	Perfor-mance	yearly capacity in tons	Projected Liner cargoes	% share Pakistan fleet
1.	2.	3.	4.	5.	6.	7.
1976	46	552.000	2.9	1.600.000	3.600.000	44.5
77	40	500.000	3.1	1.550.000	3.800.000	40.8
78	39	495.000	3.3	1.630.000	4.000.000	40.7
79	38	490.000	3.5	1.710.000	4.200.000	40.7
80	37	485.000	3.7	1.800.000	4.400.000	40.9
81	35	485.000	3.9	1.900.000	4.600.000	41.3
82	34	480.000	4.1	1.970.000	4.800.000	41.0
1983	33	470.000	4.3	2.000.000	5.000.000	40.0
84	33	475.000	4.5	2.140.000	5.200.000	41.2
85	33	480.000	4.7	2.260.000	5.350.000	42.3
86	33	480.000	4.9	2.350.000	5.500.000	43.0
87	33	480.000	5.1	2.450.000	5.600.000	43.4
88	32	480.000	5.3	2.540.000	5.800.000	43.8
89	32	480.000	5.5	2.640.000	5.950.000	44.0
90	32	480.000	5.7	2.740.000	6.100.000	44.0
1991	32	480.000	5.8	2.750.000	6.250.000	44.0

FIGURE 6

PAST AND PROJECTED PERFORMANCE

CARGO TONS PER D.W.T.
PER YEAR

GENERAL CARGO SHIPS PAKISTAN FLEET



BASED ON ACTUAL PERFORMANCE N.S.C. VESSELS

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Within the Fifth Plan period 26 of Pakistan's 46 general cargo vessels will become 20 years or older and unsuitable to operate in the liner services.

To bring the average age of the fleet down from 15 to 10 years it will be necessary to add 3 new, or practically new vessels per year in the next 7 year.

The older general cargo vessels can then be shifted to the tramp-trade and, through the improved performance, the smaller, but more efficient liner-fleet will be able to carry 40% or more of the projected liner cargoes on an economic basis.

A model of the possible distribution of the liner cargoes over the main routes for 1983 is as follows :-

	<u>TOTAL</u>	<u>40% PAK. FLEET SHARE</u>
European route	2,000,000 tons	800,000 tons
Far Eastern route	1,500,000 "	600,000 "
N-American route	1,000,000 "	400,000 "
Other routes	500,000 "	200,000 "
	<u>5,000,000 "</u>	<u>2,000,000 "</u>

A national liner fleet of 470,000 DWT at an average performance of 4.3 tons cargo per DWT per year could carry these cargoes of the three main routes as follows :

- European route : 800,000 tons cargo; performance 4.3;
14 liner vessels, average size 13,700 DWT;
40 sailings per year in each direction =
one sailing every 9 days.
- Far Eastern route : 600,000 tons cargo, performance 5.0;
9 liner vessels, average size 13,400 DWT;
29 sailings per year in each directions =
one sailing every 12 days.
- N-America route : 400,000 tons cargo, performance 3.5;
9 liner vessels, average size 14,000 DWT;
24 sailings per year in each direction =
one sailing every 15 days.

The merger of NSC and PSC or at least the combined operation of their liner services is essential for an efficient organization and scheduling of these services.

The vessels employed in the liner fleet should have about the same service speed (15-16 knots) in order to allow proper scheduling within one route and to enable interchange of vessels between the routes.

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Standardisation of machinery and equipment would facilitate maintenance and repairs.

The general requirements for the vessels on the 3 main routes are about the same : a size of about 15.000 DWT and suitable for modern cargo handling methods (container-space; flush decks for fork-lift-truck operations, sideports).

On the basis of the above considerations a standard liner ship for the Pakistan fleet should be determined and the order for a serie of 15 - 20 sister ships should bring the building cost considerably down.

If this order could be placed with K.S.E.W. this would mean a large saving of foreign exchange and would provide long-term employment for the new-building slipways of the year.

The availability of know-how and (standard) spare-parts should also encourage the planning of maintenance, repairs and surveys at the home-port with a consequent saving in time and foreign exchange. One repair berth could be kept busy on a round-the-year basis with the maintenance of Pakistan's liner fleet.

To maintain the frequency and regularity of the sailings a rigid scheduled is required, even if this would mean in some instances a reduced pay-load.

As 30-40% of the voyage time of Pakistan's liner vessels will be spent in Karachi it is of the utmost importance that the berthing and cargo handling arrangements in that port can be properly controlled.

In future Karachi will mainly handle general cargoes, of which the Pakistan fleet will carry 40% or more. A fixed allocation of 8-10 berths for the national fleet on that basis would not be unreasonable.

In order to remain internationally competitive containerization and palletisation of the liner services should be developed. This will increase the capacity of the fleet (containers on deck), improve the turn-round through fast cargo handling and prevent the loss of better paying cargoes to foreign liners or to land-transport.

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DRY (SEMI-) BULKCARGOES IN TRAMPERS

Those cargoes are expected to increase during the Fifth Plan period from 2.5 to 6.0 million tons per year and to 7.5 million tons by 1991.

Cement is being exported to Gulf-ports in smaller vessels (average size 3,600 DWT). Presently about 500.000 tons yearly but towards the end of the Fifth Plan period this is expected to increase considerably (1.500.000 tons?).

Rice exports to S.E. Asia (45%), middle East/Gulf (35%) and Africa (20%) in vessels with average size 8,300 DWT are expected to increase from 750.000 tons to 1.800.000 tons during the Fifth Plan period.

Wheat is presently still being imported (mainly from North America) in large bulk-carriers which are usually lightered outside the harbour. Within the next few years however Pakistan will start exporting wheat to destinations in the region and quantity expected for 1983 is 1.500.000 tons.

Fertilizers are being imported from mainly USA, Europe, Kuwait and Japan and this import is expected to continue on a limited scale (500.000 tons yearly now, 250.000 tons yearly by 1983). Export of fertilizers will start in the Fifth Plan period and will reach about 500.000 tons yearly, mainly to destinations within the region.

Phosphate rock imports from AQABA are expected to increase from about 250.000 tons now to 500.000 tons by 1983.

It is an imbalanced trade as more than 5 million tons will be export and less than 1 million tons import. Practically all export will be for destinations in the region (S.E. Asia, Middle East/Gulf, E-Africa) and of the imports 75% will have its origin in the region. The cargoes are therefore not combinable with the general cargo trade on the main liner routes and will be transported in full shiploads in trampers.

About 65% of these cargoes will move in 7.000/15.000 DWT vessels, 20% in 15.000/25.000 DWT vessels and 15% in smaller ships. Also taking into account the short to medium transport distances involved, it is unlikely that within the next two decades larger bulk carriers will be required for these transports.

The present liner vessels of the national fleet can be shifted to these transports when they are being replaced by more modern liner tonnage.

As all these cargoes are in the public sector it should be possible to arrange, through appropriate institutions,

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DRY-CARGOES IN BULK CARRIERS

The cargoes for the Karachi Steel Mill will start moving in 1978 and will grow to 3.5/4.0 million tons per year, based on a full production level of the Steel Mill of 1.15 million tons yearly by the end of the Fifth Plan period.

The main inputs for this production are about 2.5 million tons iron ore and 1.4 million tons coal and coke per year.

Assuming that the iron ore will be imported from N.W. Australia (a distance of about 4,200 miles) a bulk carrier can make a round trip (Southbound in ballast) in 20 years or 12 roundtrips per year. Tonnage required for these ore transports; about 225,000 DWT.

If the coal is imported from S.E. Australia (distance 6,500 miles) the roundtrip time is about 40 days or 9 roundtrips per year. Tonnage required for coal from S.E. Australia about 160,000 DWT.

Approximate cost of transport of these raw materials at present, for different sizes of bulk carriers, is as follows:

<u>TO PORT QASIM</u>	<u>FROM N.W. AUSTRALIA</u>	<u>FROM S.E. AUSTRALIA</u>
in. 25,000 DWT bulk carrier	US \$ 11.00 per ton	US \$ 16.00 per ton
" 50,000 " " "	" " 7.25 " "	" " 10.50 " "
" 75,000 " " "	" " 6.00 " "	" " 8.00 " "

In view of the large volume of cargo involved it will be necessary to utilize the largest size bulk carrier that can be accommodated. Draft limitations in Port Qasim will limit the size and to 75,000 DWT thereafter.

It is suggested to acquire in the six plan period 5 bulk carrier of 70,000/80,000 DWT to carry all ore and coal cargoes for the Karachi Steel Mill and to effect that transports during the Fifth Plan period with chartered vessels of the maximum size which can at that time be accommodated in Port Qasim.

It should be noted that if the ore or coal are from other origins that this would change the tonnage requirements. If the ore would come from Brasil (distance 8,200 miles) two more bulk carriers of 70,000/80,000 DWT each would be required.

Depending on the origin of the ore and coal the economics of transport in O.D.C. carriers (in combination with oil transport from the Gulf on the empty leg) should be investigated.

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LIQUID BULK CARGOES IN TANKERS

Of the total liquid bulk trade about 70% is import of bulk oil from the Gulf to Karachi, the other 30% being import and export of oil products. The import of bulk oil is expected to increase from 3.35 million tons in 1977 to 5.0 million ton in 1983.

The only Pakistan flag vessel engaged in this trade is N.S.C.,'s m.t. "EHAMBORT" which was acquired in 1975 (when it was already 16 years old) and which performed only 21 voyages from the Gulf to Karachi during the year 1975-76 carrying a total of 477.000 tons and making a considerable loss in the process.

With a total roundtrip distances of 2000 miles (6 sea-days at 14 knots speed) and a total port time of 2 - 3 days (2 x 12 hours pumping and 1-2 days lost time) a tanker should be able to carry 40 loads per year on this route.

The following calculation gives the ships cost per ton bulk oil, at present prices, based on a performance of 40 loads per year.

Size of tanker	<u>25.000 DWT</u>	<u>50.000 DWT</u>	<u>75.000 DWT</u>
Cost per sea-day (70%)	\$ 9.000	\$ 13.400	\$ 17.450
Cost per port-day (30%)	6.900	9.400	11.700
average cost per day	8.370	12.200	15.725
approx. cost per year	\$ 3.0 million	4.4 million	\$ 5.7 million
cargo per year (40 loads)	1.0 millions	2.0 mil.tons	3.0 mil.ton
average cost per ton	\$ 3.00	\$ 2.20	\$ 1.9

Recent oil finds near Dhodak will probably have little effect on the bulk oil imports from the Gulf to Karachi in the next few years but it might reduce projected imports in future and make it less likely that arrangements will be made to accommodate larger tankers than the 40-50.000 DWT size envisaged at present.

It is suggested to scrap m.t. "BHAMBORE" and to acquire for the national fleet two reasonable modern tankers of about 45.000 DWT each to carry the bulk oil from the Gulf to Karachi.

At the present level of freight rates (about \$ 2,60 per ton) a performarce of at least 36 loads per year is required of these vessels to break-even.

COMBINATION PASSENGERS AND RO - RO TRANSPORT

During about 4 months per year the three passenger vessels of Pakistan's fleet are engaged in the Haj-service, carrying 14,000 passengers to and from Djedda (about 20,000 passengers go by air).

The vessels are :

m.v.	"Shams"	built 1960,	passenger capacity 1112
m.v.	"Safina-E-Abid"	" 1951,	1118
m.v.	"Safina-E-Arab"	1961,	1292

With a service speed of 13 knots it takes them about 17 days for a roundtrip Karachi-Djedda-Karachi and each vessel makes 7 roundtrips on this route.

Outside the Haj-season P.S.C. operates a Gulf-service with m.v. "Safina-E-Abid" and m.v. "Safina-E-Arab" between Karachi, Gwadar, Muskat, Dubai, Doha, Bahrain and Kuwait. In 1975/76 10 roundtrips were made and apart from passengers an average of 400 tons cargo was carried per roundtrip.

The average roundtrip duration was 23 days of which 14 days were spent in port (9 days in Karachi). The conventional cargo handling, even if only small quantities are involved, takes too much time to be combined with passenger transport.

To develop this Gulf-Service it should be operated on a around-the-year basis with frequent and regular sailings. The possibilities should be investigated to operate this service with passenger/ro-ro ferries, which with a service speed of 20 knots could make a round trip, calling at all Gulf-ports, in 10 days, or in a two-port-operation in 7 days.

Below a comparison is given of the transit time in days between Karachi :-

	<u>Present service</u>	<u>Suggested ferry service</u>
and Muskat	2	1½
Dubai	3½	2
Doha	4½	3
Bahrain	6	3½
Kuwait	7½	4 or 3 (two port operation)

only a few hours would be spent in each of the Gulf-ports to embark and disembark passengers and in the ports provided with ro-ro facilities also motor-cars, trucks - and containers-on-wheels could be handled during that period.

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This ferry-service would provide a convenient short-out for truckers between the Middle-East (or even Europe) and Pakistan.

A regular service would also promote Karachi as a transshipment port (and Pakistan's liners as cargo-carriers) for cargoes with Gulf-port destinations, especially for rolling equipment and cargo-on-wheels.

Presently a regular passenger-service between Karachi and Chittagong is being considered.

This Bangla Desh Service could be operated by a similar passenger/cargo ferry making a roundtrip in 14 days, calling enroute at Colombo and may-be Bombay, Transit-time between Karachi and Chittagong would be 6 days and between Colombo and these ports 3 days. This service could be extended into the Gulf, or alternatively, connect with the Gulf-service with transshipment in Karachi.

The operation of a well-developed network of regional ferry services with Karachi as its central point would boost Pakistan's position as a location for industrial free-zones for export-oriented industries.

A study should be made of the passenger-potential on these routes and the competitiveness of improved sea-services with air-services (transit-time, fares, luggage regulations etc.).

As combination of passenger and cargo transport is probably necessary to make it a sound financial proposition, inventanisation should be made of the ro-ro facilities of the ports in the region, of possible extensions in this field and of the ro-ro freight potential.

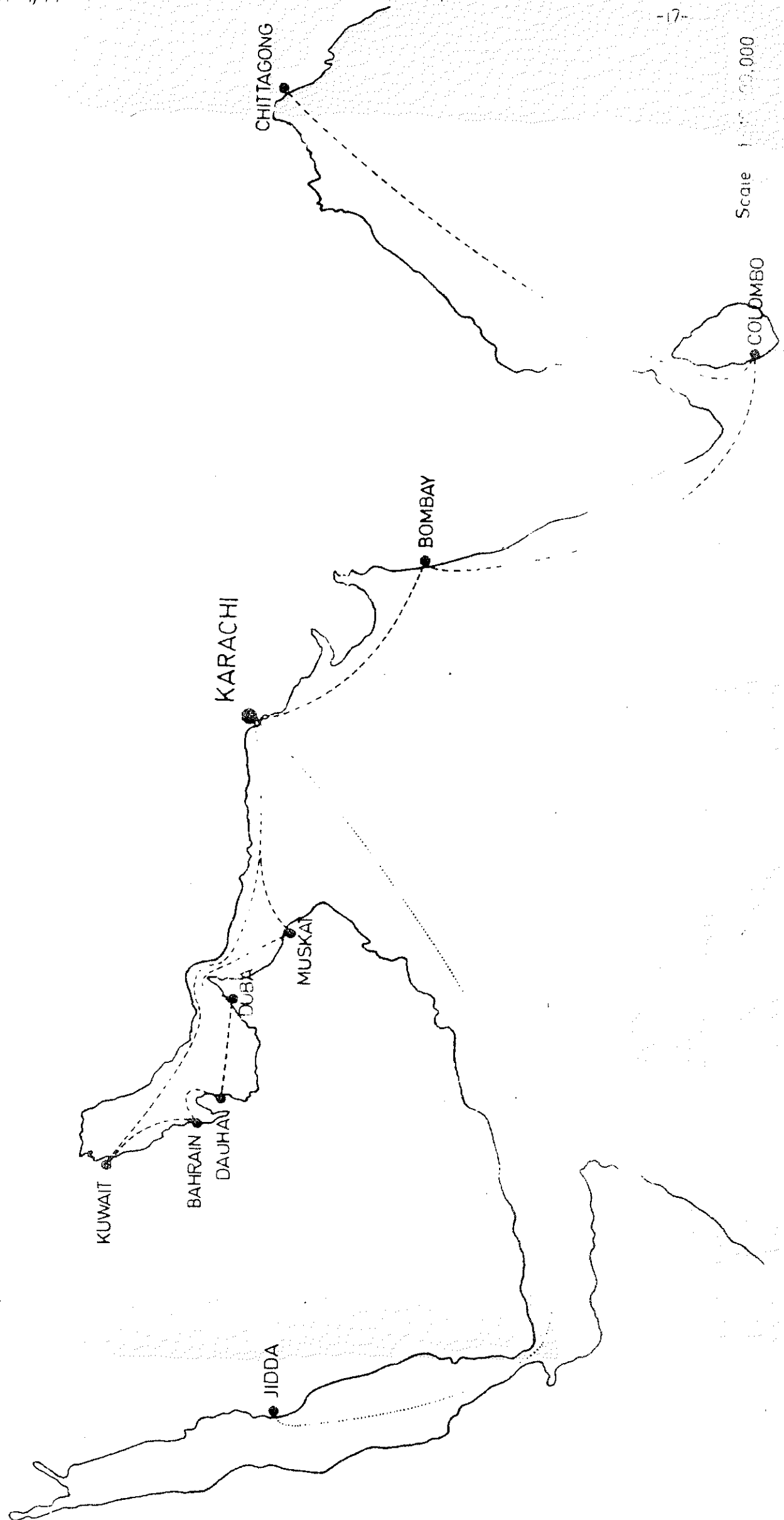
The present passenger-vessles of the Pakistan fleet are not suitable for such services and their average age is 20 years. It is suggested that for the time being they are retained for the Haj-service and to consider good quality second hand car-ferries for the proposed regional ferry services.

See page 17 for map of these routes.

PASSENGER / FREIGHT SERVICES SOUTH ASIA

FM 1-77

- HAJ SERVICE
- - - - - PROPOSED FERRY SERVICES



Scale 1:500,000

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FLEET DEVELOPMENT PLAN

Pakistan is spending currently about US \$ 200,- million per year in foreign exchange on seafreight, which amount is expected to double in the Fifth Plan period due to general increase in freight rates and the projected increase in volume of cargoes.

To carry a reasonable share (say 40%) of Pakistan's Maritime cargoes in a efficient way by the national fleet requires an ambitious programme of modernization of the fleet and a streamlining of the organization and operations.

A long term fleet development plan, spread over 15 years has been prepared, based on the following strategy :

- to increase the operational efficiency of the general cargo fleet to 4.3 tons cargo per DWT in 1983 and to 5.8 tons cargo per DWT in 1991. This requires modernisation of the fleet and disposal of vessels over 20 years of age.
- Priority will be given to rehabilitation of the liner fleet with an accelerated building programme of three standard liner vessels per year during the Fifth Plan period.
- the older general cargo vessels, replaced by modern liner vessels, will be shifted to the tramp-trade to carry semi-bulk cargoes such as cement, rice, wheat, fertilizers and phosphate.
- the dry-bulk cargoes for the Karachi Steelmill will be initially carried in chartered vessels. During the Sixth Plan period bulk carriers of about 75,000 DWT will be acquired to carry these cargoes in vessels of the national fleet.
- good quality second-hand tankers of about 45,000 DWT will be acquired to carry the bulk oil imports from the Gulf to Karachi.
- Passenger-service in the South Asian region will be developed, most likely in combination with ro-ro freight transport.

Table D, on page 19, gives the Fleet Development Schedule 1977-1991, with the composition of the fleet in respectively 1976, 1983 and the additions to the fleet during the Fifth and Sixth Plan period.

TABLE - D

FLEET DEVELOPMENT SCHEDULE 1977 - 1991

	1976			1977/1983			1983			1983/1991			1991		
	Pak D.W.T.	Fleet Mill. ion tons capa- city.	TOTAL Cargo Mill- ion tons PAK share %	New Additions D.W.T.	Mill- ion Rupces	Pak. Fleet D.W.T.	Fleet Mill- ion tons capa- city.	TOTAL cargo PAK. share %	New Additions D.W.T.	Mill- ion Rupces	Pak. Fleet D.W.T.	Fleet Mill- ion tons capa- city.	TOTAL cargo PAK. share %		
General Cargo liner ships.	552,000	1.60	3.60	300,000	2500	470,000	2.0	5.0	180,000	1500	480,000	2.75	6.25	44.0	
Dry - bulk ships	17,000	0.15	2.25	-	-	100,000	1.0	9.80	450,000	1800	500,000	5.25	11.75	44.7	
Liquid bulk ships	27,000	0.70	4.00	90,000	250	90,000	3.60	7.20	60,000	200	150,000	6.00	9.00	66.7	
Cargo ships	596,00	2.45	9.85	390,000	2750	680,000	5.60	22.00	690,000	2500	1,130,000	14.00	23.00	52.0	
Passenger/ro-ro ships				10,000	250				10,000	250					
Total fleet investment.				400,000	3000				700,000	3750					

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The new additions to the fleet during the Fifth Plan period will be 20 liner vessels of about 15.000 DWT each, based on new-building prices of about \$ 800,-per DWT; two second-hand tankers of 45.000 DWT at a price of about \$ 12.5 million, each and 3 passengers/ro-ro ferries of 3.000/4.000 DWT each (second-hand price estimated at \$ 8.-million each).

The emphasis in the Fifth Plan period is on the new-building programme of liner-vessels and on page 11 it is suggested that NSC and PSC together should decide on a standard vessel to operate in their liner services. The order of a serie of sister-ships should bring down the building cost considerably and would, due to standardisation, simplify future maintenance.

Preferably the order should be placed with K.S.E.W., which shipyard has presently no regular employment for its two new-building slipways.

K.S.E.W. should have capacity to build 2 standard liner vessels per year and should also, with one repair-berth, be able to cater for the majority of the normal maintenance and surveys of the national fleet.

The advantages of building and maintenance in home-port are evident (foreign-exchange saving; inspection/control; availability standard spare-parts; know-how; saving in time by cutting out ballast trips).

It is suggested to form a combined "design team" to decide about the most suitable standard liner vessels for NSC and PSC. The commercial and operational people to determine the requirements as regards quantity and type of cargo to be carried, cargo-handling methods to be employed etc., and the technical people to establish the "profile" of the vessels which can fulfill these requirements. Discussion should then be held with K.S.E.W. to find out the building programme that can be offered and the price per ship.

In the meantime, on the financial side, it should be investigated what credit facilities can be obtained and what official consideration can be expected from the Government to effectuate this large saving in foreign exchange and increase in local employment. Facilities when building abroad are generally 7 year credit at 7% interest, on 70% of building price.

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ORGANIZATION:

There are two state shipping companies in Pakistan, NSC and PSC, each with a fleet of about 300,000 DWT. Both companies are operating liner services to Europe, North American and far East and both are interested in tankers and bulk-carriers.

On practically all fronts they are duplicating activities in direct competition with each other and both companies, with an aging fleet, are generating insufficient income for an adequate fleet - replacement.

A united fleet of 49-50 ships, through pooling of human and material resources and streamlining of the organisation, will be much better geared to carry Pakistan's maritime cargoes.

A policy decision about the future organisation of Pakistan's fleet should be made without delay as this will be a basic issue in the development towards a efficient maritime industry.

Best solution would be a complete merger between NSC and PSC with a interim position of joint companies, for the different activities, in which PSC and NSC have a 50% share each. If for some reason a merger would not be possible the only other practical option would be specialisation in the activities of the two companies, for instance one company operating all deep-sea liner services and the other company operating all passenger/ferry service, trampers, tankers and bulk-carriers.

The most logical solution of the merger of NSC and PSC, into one state shipping corporation (say: PNSC) would take a few years to be implemented.

The 9 shipping companies forming the PSC will be fully merged into that company by 1978, after which the merger of NSC and PSC could be worked out.

In the meantime there should be a close coordination between NSC and PSC on all existing activities, such as liner-services, chartering etc.

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All new activities, such as ferries tankers, bulk-carriers, containers, port-handling, should be undertaker jointly. These activities could be assigned to new units in which both NSC and PSC have a 50% share. After the merger these units can be integrated as departments of the newly formed PNSC.

It is also suggested that teams will be formed from personnel from the two companies to jointly study the following subjects.

1. A "design-team" to determine the specification of a standard liner vessel for the national fleet, in cooperation with K.S.E.W.
2. A "port operations team" to make recommendations about the organisation of work on the berths to be allocated to the national fleet, in cooperation with K.P.T.
3. A "containersation team" to study the problems of container-ownership, maintenance, control, handling and land-transport, in cooperation with P.R.
4. A "ferry-service team" to investigate the possibilities of developing a network of ferry-services in South Asia.
5. A "coordination team" to look into the possibilities of combined operations, already before the merger, of such activities as purchase of provisions and spares, ships-maintenance, bunker-, agency - and stevedoring contracts in foreign ports, public relations, insurance tec.

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PORT OPERATIONS

Presently all Pakistan's imports and exports by sea have to be handled at the port of Karachi and due to capacity limitations and low productivity there are considerable delays for all conventional cargo ships. There are something like 30 vessels outside the port waiting for about a month for their turn on a loading or discharging berth (average for 1975/76 was half month).

Once the ships are at their berth they are delayed by low handling rates per hook per hour, especially for general charges (4.1 tons per hour for imports, 9.3 tons per hour for exports).

The additional cost on account of these delays is past on to the cargo interests in the form of congestion surcharge, which for liner cargoes, on the basis of a surcharge of 15%, amounts to about US \$ 36.0 million per year. If there would be no change in the congestion position this figure would be doubled by 1983.

Port capacity will be considerably improved within the next few years when Port Qasim will start operating to handle the bulk and semi bulk dry cargoes, which would mean that nearly 20 dry cargo berths in Karachi would be available for liner cargoes.

As the volume of these cargoes will increase by about 50% over the next 7 years considerable improvements in the cargo flow through the port (organisation of collection and delivery of cargoes, higher productivity per hook per hour) will be required to reduce congestion.

As long as present conditions persist ships of the national fleet are especially hit by this congestion as they have to discharge and load all their cargoes in Karachi. Foreign liner vessels have only part cargoes for this port, which they can very often handle via lighters (15-20% of Karachi's dry cargo is handled that way).

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Another advantage of foreign ships is that they can cut the time waiting for berth at outer anchorage by registering their call at Manora, then proceeding to ports in the vicinity and to come back to Karachi by the time their turn for a berth comes up.

Pakistan's liner vessels spent about 11/12 weeks in homeport on each roundtrip. With the expected increase in performance and reduced congestion this port-time will be about 5 weeks by 1983.

With a regular spacing of sailings this would mean that there will be always about 8-10 liner vessels of the national fleet in Karachi.

As this fleet is carrying about 40% of Pakistan's liner cargoes it would not be unreasonable if it would get a fixed allocation of 8-10 berths out of the total 28 general cargo berths in Karachi.

This would enable the national liner operators to improve planning and control the cargo handling and the delivery and collection of cargoes to and from the port-area.

They should space the sailings and maintain the schedule in such a way that not more than 10 of their vessels are in Karachi at the same time.

An arrangement for this berth allocation should be discussed with K.P.T.

The allocation of a fixed number of berths to the national fleet can only be justified on the basis that the thought put on these berths is at least as good as the average for the port.

With frequent sailings (=reduced time between delivery of cargo and loading on board) and larger quantities of cargo per ship throu-put should in fact be well above average.

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CONTAINERIZATION:

The only regular container service to Karachi at present is operated by the American President Line, calling every two weeks, with 100 containers in and 100 containers out, mainly 20 ft and some 40 ft. containers.

They have 5 container-ships, fitted with own container handling gear, each ship making a round-trip in ten weeks, calling at 29 ports on the route E.C.U.S. - Panama Canal - W.C.U.S. - Far East - South Asia - Suez Canal - Mediterranean - E.C. U.S. They are the only ships calling at Karachi which are not affected by the congestion.

As in future an increasing proportion of Pakistan's liner cargoes will be suitable for containerisation the national fleet should be preparing to participate in these transports by initiating a pilot scheme on one of the main liner routes, for instance on the UK/Continent service, which offers most frequent sailings.

If we take it that by 1985 at least 10% of the general cargoes on Pakistan's liner vessels will be suitable for containerisation, this would mean for the UK/Continent route 80,000 tons per year, or about 6,000 container-loads (based on I.S.O. containers of 20 feet), say 3500 loads inwards and 2500 loads outwards. This would be about 90 container movements per sailing which could be carried mainly on deck on the new liner vessels.

The roundtrip of a container would be about 12 weeks and about 800 containers would be required for this operation. Container-cost (amortisation or hire, maintenance, insurance, overheads) would work out at about US \$ 10,- per freight-ton or average valued commodities.

Containers would be earmarked for last-day loading/first day discharge and could thus give a door-to-door transit time of 5-6 weeks. An extra freight rate could be asked for this "Express service", which will also give the shippers savings in packing, insurance and interest.

A container berth with gantry crane (investment about \$ 1.0 million) would be required in Karachi, capacity to handle 20 containers per hour.

Inland transport and container-handling up-country (dryport) to be discussed with P.R.

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FINANCIAL PERFORMANCE:

The prospects for the financial results of the Pakistan fleet for the coming years are as follows :

1. Liner trade.

Due to the low performance the fleet is at present in a loss situation.

N.S.C. in its Report and Accounts 1975-76 stated a net profit of about \$ 3.8 million and declared a dividend of 12%. However depreciation was (based on historic 1 cost) only \$ 3.0 million. On this basis it would require the depreciation over 4 years to replace one vessel of the fleet.

In fact, even on historic-cost-basis, the depreciation of a fleet of average 12,5 years age (leaving 7,5 years economic life) with a written down value of \$ 45,0 million should have been \$ 6.0 million.

In order to arrange for an adequate replacement of the fleet the provision for depreciation should have been \$ 12 - 15 million.

The following calculation is made for a liner vessel of 15,000 DWT, newbuilding price \$ 12.0 million, with depreciation based on economic life of 20 years, cost of capital 10% and operating at performance, of resp. 3, 4, 5 and 6 tons cargo per DWT per year :

	Cost per freight-ton in US \$ at performance			
	3	4	5	6
Interest + depreciation	26,64	20.00	16.00	13.36
Crew, provisions, stores, spares, maintenance, Surveys, insurance	16.00	13.04	11.20	10.00
Fixed Cost	42.64	33.04	27.20	23.36
Ports + bunkers	13.28	12.48	12.00	11.68
Stevedoring + commissions	12.00	12.00	12.00	12.00
Variable Cost	25.28	24.48	24.00	23.68
Total direct cost	67.92	57.52	51.20	47.04
Indirect cost (10%)	6.79	5.75	5.12	4.70
Total cost	74.71	63.27	56.32	51.74

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The average freight rate for liner cargoes in 1975/76 was \$ 63,- per freight-ton, at which figure a performance of at least 4 tons cargo per DWT per year is required to break even.

In fact the performance was less than 3 tons per DWT per year, which, according to the calculation on page 26 would give a loss of \$ 12,- per ton cargo carried.

As the liner vessels account for about 85% of the freight revenue of the national fleet it is of the utmost importance to improve the performance to at least about 4 to get the fleet out of this loss situation.

2. tramp trade:

The freight rates are less stable than in the liner trade and it is difficult to predict the performance of the vessels which is very much depending on the market situation and seasonal influences.

This trade will be operated with the older vessels of the fleet and depending on the level of the tramp rates and the condition and operating cost of the individual vessels it can be decided at the appropriate time whether to continue trading or dispose of the ships.

The average freight rate for liner cargoes in 1975/76 was \$ 63,- per freight-ton, at which figure a performance of at least 4 tons cargo per DWT per year is required to break even.

3. bulk trade:

The bulk-carriers for the steelmill-cargoes will be acquired on the basis of long-term contracts for a trade on a fixed route. With a reasonable performance of these vessels the financial results will be predictable, but not spectacular.

4. Bulk-oil trade:

The acquisition of tankers will also be based on long term contracts, for the carriage of crude oil from the Gulf to Karachi.

As discussed on page 14 a performance of at least 36 loads per year is required to break even at present freight-rates.

The freight rates are less stable than in the liner trade and it is difficult to predict the performance of the vessels which is very much depending on the market situation and seasonal influences.

This trade will be operated with the older vessels of the fleet and depending on the level of the tramp rates and the condition and operating cost of the individual vessels it can be decided at the appropriate time whether to continue trading or dispose of the ships.

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SUMMARY OF RECOMMENDATIONS:

- Merger:

A policy decision should be take in connection with the merger of N.S.C. and P.S.C. into one Pakistan National Shipping Corporation.

- Pending this merger: a) close coordination of the operation of both companies.
- b) all new activities to be undertaken jointly.

- Fleet Development Plan:

Determination of specification of standard liner vessel.

Building of a serie of these standard liner vessels in Karachi.

- Port Operations:

Allocation of number of fixed berths to national fleet.

Provision of Container - berth with gantry crane and roll-on-roll-off berth.

- Public sector cargoes:

Institutional arrangements to promote carriage of public sector cargoes by national fleet.

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This report and its recommendations will be discussed at a meeting in Karachi second half of February 1977 when also a implementation schedule will be proposed.