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THE FEASIBILITY STUDY REPORT ON THE FLEET EXPANSION PROGRAM IN THE REPUBLIC OF SENEGAL.

Dec. 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

It is with great pleasure that I present this Feasibility Study Report on Fleet Expansion Project in the Republic of Senegal to the Government of the Republic of Senegal.

This report embodies the result of a feasibility study which was carried out from July 11th to July 30th, 1980 by a Japanese survey team commissioned by the Japan International Cooperation Agency following the request of the Government of the Republic of Senegal to the Government of Japan.

The survey team, headed by Mr. Yoshiyuki Shibuya, Special Advisor to Japan Maritime Research Institute had a series of discussions with the officials concerned of the Government of the Republic of Senegal and conducted an extensive field survey and data analyses.

I sincerely hope that this report will be useful as a basic reference for development of the project.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Senegal for their close cooperation extended to our team.

December, 1980

Keisuke Arita

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Keisuke Arita
President
Japan International Cooperation Agency

CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY

1. Purpose and Background of Fleet Expansion Project

The economy of the Republic of Senegal may be described as a monoculture-type one, exporting primary products such as groundnuts, processed groundnuts, phosphate and processed marine products and importing consumer goods, food, and manufactured goods.

In order to advance away from this monoculture-type economic structure, Senegal is now carrying out its 5th Economic Development Plan (1977 - 1981), placing emphasis on higher food self-sufficiency and promotion of industry as the priority objectives.

However, as a result of the increase in crude oil prices since 1978, the global inflation, and crop failure because of drought, the country's shortage of foreign exchange has become extremely serious. Therefore, the improvement of its balance of international payments has become the most urgent and important policy of the country.

As one of the surest measures having quick effect, the fleet expansion Project has been formulated as a priority measure item.

The countries of Western Africa are making great efforts to develop their own national lines. Major countries, like Nigeria and Ivory Coast, already possess their national lines which provide liner services and are strengthening their shipping activities steadily. Senegal, however, at the present time does not have its own vessels.

The establishment of its line is desired by Senegal for the economic and political reasons.

2. Outline of the Project

This project will be implemented by a national line under the jurisdiction of the Ministry of Equipment and supported by the Senegalese Government. The outline of the project is as follows:

(1) The Principal Administrator

Compagnie Senegalaise de Navigation Maritime (COSENAM)

This is a Senegal's national line established in October 1979 with 84% of its capital coming from Senegalese sources.

(2) Substance of the Project

Two 9,000 D/WT multi-purpose vessels will be constructed and assigned to liner trade between Dakar and ports on the French Atlantic coast and in Belgium. (40 days for one voyage; 18 voyages per year with two vessels.)

(3) Vessels planned for Construction

- Type and number of vessels --- Multi-purpose vessels capable of carrying general cargoes, containers, and dry bulk cargoes --- Two vessels
- Deadweight tonnage and capacity --- 9,000 D/WT, 13,300 m^3 grain/12,000 m^3 bale (stowable containers: 326 units)
- Length x Breadth x Depth x Draft --- 120m x 19.20m x 10.60m x 8.00m
- Speed --- 15.3 Kt (at 6,400 D/T)
- Main engine --- 5360 HP (diesel engine)
- Hold/hatch --- 3 holds/5 hatches (No. 2 and No. 3 holds in twin deck)

3. Examination of the Project

(1) Specifications and Price of the Ship

An examination of the ship specifications planned by Senegalese side (hereafter referred to as Plan "A") reveals that there are technical problems with respect to stability, speed, and the number of stowable containers.

According to the estimation made by the survey team, the ship's price under Plan "A" will amount to about 2,950 million yen per vessel. A trial calculation of the internal rate of return (IRR) based on this ship's price reveals that the feasibility is questionable.

Taking the technical and financial aspects into account, the survey team conducted an overall review and drafted a revised ship's specifications (hereafter referred to as Plan "B").

The Plan "B" retains the deadweight tonnage, hold capacity and principal dimensions of the Plan "A". Revisions were made in main engine, propeller, cargo hatches, and crane capacity, with a view to solving the technical problem and reducing the total shipbuilding cost. Under the Plan "B", the ship's price was reduced to 2,700 million yen.

(2) Operation Plan with Voyage Accounts

As for the operation plan, 40 days per voyage and 18 voyages per year by two vessels are possible.

In the estimation of voyage account, there are questionable points in COSENAM's plan regarding both revenues and expenses. The result of the survey team's estimation shows that the annual revenue per vessel would be about 1,101 million CFAF, with the balance before capital expenditure in the first year becoming about 244 million CFAF in the case of Plan "A" and about 248 million CFAF in the case of Plan "B".

(3) Financial and Economic Evaluation

The internal rate of return as worked out by the survey team is as follows:

Plan "A" ----- 5.89%

Plan "B" ----- 7.32%

This shows that the feasibility of Plan "B" is more reasonable than "A".

The contribution to the international balance of payments by this Project is expected to amount annually to about 940 million CFAF before payment of capital and interest.

4. Conclusion and Recommendation

(1) Conclusion

From the technical and financial angles, the specifications of the Senegalese side(Plan "A") do not appear to be as feasible.

As for the revised plan (Plan "B"), it has sufficient feasibility if the project is operated by taking into account the managerial points which require particular attention.

(2) Recommendation and Opinions

In view of the urgency of improving the international balance of payments and the trend among Western African nations to operate national lines, it is desireable that this project be implemented as quickly as possible. Therefore, the ship specifications should be re-examined as soon as possible and flexible measures should be taken whilst taking into full consideration

The points to which special attention should be paid in carrying out this Project are as follows:

(a) In liner trade operation, it is important to run ships on schedule, to increase voyage revenue through rationalization of ships operation,

and to maintain reasonable freight rates through cooperation with conference members.

(b) With respect to management control, it is necessary to reduce fixed costs such as administrative expenses and ship's cost through budgetary controls.

PART I INTRODUCTION

1. Objectives and Outline of Survey

For the purpose of developing a national line, the Republic of Senegal proposed to the Government of Japan a plan for the building and procurement of two 6,000-ton Roll on/Roll off multi-purpose vessels based on yen credit in June 1979.

Upon studying this plan, the Japanese Government deemed that it would be necessary first of all to send a survey team of Japanese experts to examine further the details of the plan and related circumstances in order to determine its feasibility. Acknowledgement to accept a survey was obtained from the Senegalese Government and a seven-man survey team was dispatched to Senegal from July 11 to July 30, 1980.

When the survey team began its study in Senegal, the Senegalese authorities informed the survey team that the organization which was in charge of the original plan had been disbanded and that a national shipping line was newly established. As a result of its study, the national shipping line had decided on a new plan to build and procure two 9,000-ton cargo vessels, which had been fully supported by the Senegalese Government. Thence the survey team was requested to conduct a feasibility study of this new plan.

The survey team consulted the Japanese Government and, on the latter's instructions, the objective of the survey team was changed to a study of the new plan, including confirmation of its details. The team made its utmost efforts throughout the activity with the cooperation of the parties concerned on the Senegalese side.

The survey team, in addition to its study in Senegal, stopped off in France and the United Kingdom on its way back to Japan in order to gather information from shipping circles in these two countries which have very close shipping relations with West Africa. The survey team thus obtained almost sufficient data necessary for studying the feasibility of the plan.

This report was compiled after analyzing and studying the information and data which the survey team had brought back to Japan.

2. Member of the Survey Team

Leader		Yoshiyuki SHIBUYA Japan Maritime Research Institute (JMRI)
Member	Maritime Policy	Sadataka MANABE Overseas Division, Shipping Bureau, Ministry of Transport (MOT)
Member	Shipbuilding	Hiroshi OKADA Ship Division, Kanto District Maritime Bureau, MOT
Member	Ship Design	Kaname HATTORI JMRI
Member	Shipping Management	Soichiro OTOMO JMRI
Member	Marketing and Financial, Economic Analysis	Kunihiro OTAKE JMRI
Member	Coordination	Masahito OYAMA Social Development Cooperation Department, Japan International Cooperation Agency

3. Itinerary of the Survey

Date	Day of Week	Business	Persons Interviewed
11 July, '80	Fri.	Departure from Tokyo	
12	Sat.	Arrival in Dakar	
13	Sun.	Preliminary meeting	T. Yanagiya, Second Secretary, Japanese Embassy
14	Mon.	Courtesy call and preliminary meeting at Japanese Embassy	S. Uchida, Ambassador T. Yanagiya, Second Secretary
		Courtesy call at MAE	I. Caba, Directeur de Cooperation Economique, MAE
			P.Y. Dia, Directeur-Adjoint de Cooperation Economique, MAE
		Courtesy call at MPC	L. Alexandrenne, Ministre de Plan et du la Cooperation
			D. Diop, Directeur du Financement du Plan, MPC
15	Tue.	Observation of Port of Dakar	
16	Wed.	Joint meeting at ME	I. Deme, Directeur General des Transports, ME
			S. Boissy, Directeur des Affaires Maritimes et Marine Marchande, ME
			A. Diouf, Directeur, PAD
			G.M. Diop, Secretaire General, COSEC
			S. Sarr, Directeur General, COSENAM
		Meeting at Japanese Embassy	S. Uchida, Ambassador
			T. Yanagiya, Second Secretary

Date	Day of Week	Business	Persons Interviewed
17 July,'80	Thu.	Visit to COSEC	G.M. Diop, Secretaire General, COSEC
			C.T. Niang, Chef du Service Etudes et Tarifs, COSEC
		Visit to PAD	A. Diouf, Directeur, PAD
			D. Halle, PAD
			E. Belin, PAD
		Courtesy call at ME	A. Senghor, Ministre d'Etat charge de l'Equipment
			I. Deme, Directeur General des Transports, ME
		Visit to COSENAM	S. Sarr, Directeur General, COSENAM
			J. Guillaumet, Conseiller Technique
			H. Mulac, Staff of Consultant
18	Fri.	Visit to Marine Department	S. Boissy, Directeur des Affaires Maritimes et Marine Marchande, ME
		Visit to Dakar Marine	F. Ba, President, Dakar Marine
21	Mon.	Visit to Port of Dakar and Observation	A. Diouf, Directeur, PAD
		Collection of Data	MPC, Chambres de Commerce et d'Industrie, etc.
		Visit to CSPT	M. Sy, General Manager, CSPT
22	Tue.	Visit to COSENAM	S. Sarr, Directeur General, COSENAM
			J. Guillaumet, Conseiller Technique
		Meeting at Japanese Embassy	T. Yanagiya, Second Secretary

Date	Day of Week	Business	Persons Interviewed
22 July,'80	Tue.	Visit to CSPT	A.C. Kane, Ingenieur Commercial Service Embarquements, CSPT
		Visit to Marine Department	S. Boissy, Directeur des Affaires Maritimes et Marine Marchande, ME
23	Wed.	Meeting at MPC	C. Kebe, Secretaire General du Plan et de la Coorperation, MPC
			D. Diop, Directeur du Financement du Plan, MPC
			M. Camara, Directeur-Adjoint du Financement du Plan, MPC
			P.Y. Dia, Directeur-Adjoint de Cooperation Economique, MAE
			K. Kitaban, First Secretary, Japanese Embassy
		Reception in Audience of the President	L.S. Senghor, President, Republic of Senegal
			S. Uchida, Ambassador
			T. Yanagiya, Second Secretary
24	Thu.	Meeting at MPC	M. Camara, Directeur-Adjoint du Financement du Plan, MPC
			S. Boissy, Directeur des Affaires Maritimes et Marine Marchande, ME
			P.Y. Dia, Directeur-Adjoint de Cooperation Economique, MAE
			S. Sarr, Directeur General, COSENAM
			K. Kitaban, First Secretary
			T. Yanagiya, Second Secretary

Date	Day of Week	Business	Persons Interviewed
25 July,'80	Fri.	Visit to Shipping Agent	G.E. Guillabert, USIMA
		Visit to Ecole Nationale de Formation Maritime	I. Diagne, Directeur, Ecole Nationale de Formation Maritime
26	Sat.	Meeting at Japanese Embassy	K. Kitaban, First Secretary T. Yanagiya, Second Secretary
		Departure from Dakar	
27	Sun.	Arrival in Paris Arrival in London	
28	Mon.	Visit to Shipping Conferences	G.W. Howe, UKWAL, London J.W. Hickman, UKWAL, London P. Meffre, COWAC, Paris
29	Tue.	Departure from Paris and London	
30	Wed.	Arrival in Tokyo	

Notes:

MAE : Ministere des Affairs Etrangeres
MPC : Ministere du Plan et du la Cooperation
ME : Ministere de l'Equipment

COSENAM : Compagnie Senegalaise de Navigation Maritime
COSEC : Conseil Senegalaise des Chargeurs
PAD : Port Autonome de Dakar
CSPT : Compagnie Senegalaise des Phosphates de Taiba

PART II ECONOMIC AND SOCIAL CONDITIONS

1. General Situation

Senegal is situated in an area covered by 12 degrees and 16 degrees north latitude, and 11 degrees and 17 degrees west longitude. Dakar, the capital, is an important seaport located at the westernmost tip of the African Continent. Senegal's land area is about 197,000 square kilometers, most of which is lowlands less than 100 meters above sea level. Its climate changes gradually from the deserts and savanna in the north to the tropics in the south. Annual precipitation ranges from 350 mm in the north to 1,500 mm in the south.

The population of Senegal was approximately 5,350,000 as of mid-1978, with roughly one-fifth concentrated in the capital and vicinity. The official language is French. The biggest religion is Islamism, about 80% of the population being Muslims. Others profess Christianity and indigenous religions.

Senegal became an independent republic within the French Community in November 1958. The Republic of Senegal was proclaimed in August 1960. Leopold Sedar Senghor was elected the country's first president in September that year. The president, elected by universal adult suffrage, is the chief administrator as well as the head of state. The cabinet is named by him. The legislature of Senegal is the National Assembly, whose members are also elected by universal adult suffrage. There are courts of different grades under the Supreme Court.

The Senegalese economy consists of agriculture centering on groundnuts production, the country's principal export item, and the fairly sophisticated consumption economy in the urban area. Phosphate is another important export product and fishing is a fast growing industry. Other industries are still at their primary stage except some light industries. Despite groundnuts, phosphate, and a few other export items, Senegal suffers from a chronic trade deficit because it must import huge amount of food, oil and industrial products. The Senegalese Government has been carrying out economic and social development programs to stabilize its economy in a longer perspective.

2. Main Industries

2-1 Agriculture

2-1-1 Foodstuff

Senegal's main crops have long been millet, maize, manioc and sweet potatoes. Recently rice has begun to be grown in increasing volume in the southern part of the country. Senegal is an agricultural country with some 70% of its population engaged in farming. And yet its farm crops are not sufficient for the domestic demand. Even in the FY 1975-76, when crops were relatively good, it had to import a considerable volume of food.

(1000 tons)

	Production (Jul. 1975-Jun. 1976)	Import (Jan.-Dec. 1976)	Total	Rate of Self-support
Cereals/Potatoes	911	324	1,235	74%
Rice	116	245	361	32%
Total	1,027	569	1,596	64%

2-1-2 Merchandise Crops

(1) Groundnuts

Groundnuts and groundnut products are Senegal's most important export items. In the FY 1975-76, they accounted for some 65% of the country's total agricultural turnover in terms of value and for about 54% of its total export value, excluding oil for re-export. This shows the importance of the groundnuts production for the national economy of Senegal. Although groundnuts are grown in areas with less rainfall, the crop has been badly hit by severe droughts which Senegal has experienced almost every two years. The FY 1977-78 groundnut crop was 65% less than in FY 1975-76. Consequently, the exports of groundnuts and groundnut products have widely fluctuated in recent years.

(2) Raw Cotton

Raw cotton is grown mainly in the southern area. The industry has rapidly grown since the country's independence, with the acreage increasing 28-fold and the output expanding 62-fold over the 14 years from 1964 to 1978. The cotton crop was rather lean in 1978. About two-thirds of the annual crop is exported.

	1964	1968	1972	1977	1978
Area (ha)	1,682	6,686	20,359	43,700	47,000
Production (tons)	606	9,755	23,511	95,200	37,500
Value (million CFAF)	-	-	-	4,474	1,838

The fifth four-year program currently in progress calls for a 70% increase in the country's raw cotton crop through a 40% increase in the acreage and a 20% increase in the cropper acre.

2-1-3 Integrated Agricultural Development

The country's acreage under cultivation totals 25,000 square kilometers, of which only 5% is irrigated land. The Senegalese economy has suffered great damage as a result of repeated droughts in the 1970s. Senegal has just launched an integrated agricultural development program which lays particular emphasis on irrigation. Efforts are being organized to make the most use of its major rivers, the Senegal, Gambia and Casamance which all originate in the tropics.

2-2 Livestock Industry

The number of livestock (not including chickens) in Senegal is about equal to the country's population.

in 1977	(1000s)
Oxen	2510
Sheep and goats	2810
Pigs	330
Horses	230
Asses	210
Camels	10
Total	6100

There are also about 8,410,000 chickens. Several hundred tons of meat is exported annually to neighboring countries, with the balance consumed domestically. Hides and skins are mostly exported.

2-3 Fishery Industry

Senegal is one of the major African fishery countries, with its coastline stretching 600 kilometers and continental shelf totaling 10,000 square kilo-

meters. Hauls consist of many different species of fish. Fishing boats vary in size, but an overwhelming majority is small boats with an outboard motor.

Number of Fishing Boats

	1974	1975	1976	1977	1978
Small Scale Fishing					
Sailing canoes	2,255	2,000	2,257	3,593	3,796
Motor canoes	4,187	4,041	3,843	3,263	3,957
Canoes with outboard motor	22,024	16,951	18,951	28,779	28,406
Canoes	6	-	-	5	10
Sub-total	28,472	22,992	25,051	35,640	36,159
Industrial Fishing					
Sardine boats	16	11	12	9	8
Trawlers	86	90	76	82	88
Tunny boats	42	42	42	32	34
Sub-total	144	143	130	123	130
Total	28,616	23,135	25,181	35,763	36,289

The industry's catch has been stable at some 350,000 tons for the last five years. About 20% of the volume and some 60% of the value is for export. The tuna catch has been increasing in recent years, contributing to the steady growth in the industry's total catch in terms of value.

Fishing Production

	Volume (1000 tones)					Value (million CFAF)				
	1974	1975	1976	1977	1978	1974	1975	1976	1977	1978
Small Scale Fishing	263	279	277	212	227	14,903	17,382	18,844	14,274	15,860
Industrial Fishing										
Sardin-boat production	50	46	44	40	26	751	916	989	1,284	862
Trawler production	15	16	19	77	74	3,014	3,024	3,640	7,353	7,753
Tunny-boat production	19	13	11	13	26	3,093	1,825	1,580	2,519	5,236
Sub-total	84	74	74	130	127	6,858	5,765	6,209	11,156	13,852
Total	347	353	351	341	353	21,761	23,147	25,053	25,429	29,713

2-4 Mining Industry

2-4-1 Phosphates

Phosphates are produced mainly at Taiba and Thies, both located about 100 kilometers northeast of Dakar.

Mines	Classification	Purity	Annual Production
Taiba	calcium phosphate	81%	1,500,000 tons
Thies	alminum phosphate	29%	200,000 tons

The phosphates are brought by railway to Dakar for export. For many years, phosphate exports ranked second after groundnut exports in terms of value. They have been replaced recently by the rapid growth of fishery exports. But in terms of volume, phosphates continue to account for more than half of the country's total exports.

2-4-2 Iron Ore

An iron mine with an estimated amount of deposits totaling 600 million tons (with an iron content of 66-68%) has been discovered at Faleme in southeastern Senegal. Located 750 kilometers away from the coast, the mine has yet to be developed, because an enormous amount of money is needed to construct a transportation route between the mine and the port of shipment.

2-4-3 Rock Salt

Rock salt is mined near Kaolack. Annual production totals 150,000 tons and is mostly exported.

2-5 Manufacturing

Manufacturing is mostly light industries, such as groundnut processing, cotton, canning, match, tobacco, soap, beverage, footwear, etc. Senegal produces cement more than enough for the domestic demand. The surplus is exported.

2-6 Tourist Industry

Dakar is a well-known resort and one of the cultural centers in Western Africa. Foreign tourists who traveled to Senegal numbered 168,000 in 1977 and 194,000 in 1978, 35% of them being French and 10% peoples from the French-speaking African countries. Foreign currency earned by the tourist

industry was estimated at 11 billion CFAF in 1977 and 13 billion CFAF in 1978. Thus tourism is a major source of revenue for Senegal, which suffers from chronic balance of payments deficits. The industry also plays a major role in the employment field as it offers many jobs through such service as hotel, restaurant, taxi, etc. The country's fifth four-year plan calls for increasing the number of hotel rooms from 3,634 to 6,250. The program also envisages 22 billion CFAF of annual tourist revenue.

2-7 Infrastructure

Dakar, once the capital of all French West Africa, has good transport facilities, such as roads, railways and port and harbor. It also provides good utility services including electricity, water and gas. The quality of utility services in Dakar and other Senegalese cities is far better than those in other West African countries. Senegal's public utility services provide jobs to 15% of workers among the 177,000 of employed workers.

2-8 Labor Force

Senegal's labor force totaled 2,007,000 in 1977. The number of employees, excluding self-employed farmers and fishermen, was small at 177,000 or only 8% of the total labor force. Those engaged in unproductive jobs, such as public services, commerce, hotel, restaurant business, transport, communication and banking, numbered 120,000 or as much as 68% of all employed workers. The figures seem to indicate that Senegal's industry is not mature and still at the development stage.

Number of Employees by Sector in 1977

Sector	Number	Percent
Agriculture/Stock-farming/Forestry/Fishing	9,981	5.6
Mining	6,010	3.4
Manufacturing	30,479	17.2
Utilities	5,366	3.0
Construction/Public works	5,151	2.9
Commerce/Hotels and restaurants	20,820	11.8
Transport and communications	17,922	10.1
Banking and insurance	3,542	2.0
Other services	8,049	4.6
Private sector sub-total	107,320	60.6
Civil service	50,740	28.7
Public institutions	18,930	10.7
Public sector sub-total	69,670	39.4
Total	176,990	100.0

3. Foreign Trade & International Balance of Payments

3-1 Balance of Foreign Trade

Senegal had trade deficits totaling 25-35 billion CFAF annually between 1974 and 1977. The deficit increased dramatically in 1978 when groundnut and groundnut product exports fell sharply due to a drought. A sizable value of oil is included in both exports and imports. The exported oil is seen to be re-exports of imported oil in the form of refueling foreign vessels at the port of Dakar. The balance of oil trade in 1977 was a net inflow of some 500,000 tons and a deficit of about 10 billion CFAF. The deficit was supposed to have widened further in 1979 because of the steep oil price increases during the year. On the other hand, one of the few factors that check deterioration in Senegal's trade balance is its rapid growth of fishery exports.

Senegal suffered a trade deficit of some 6 billion CFAF with its biggest single trade partner, France, in 1976. On account of the poor groundnuts crop, the deficit with France expanded to some 33 billion CFAF in 1978. The

quantities of imported grains, mainly rice, from the United States, Pakistan and Spain has been increased to cope with the food shortage caused by the repeated droughts. Its imports from Algeria, Iraq and Dubai are supposed to be mostly oil. The major proportion of imports from West Germany, Netherland and Luxembourg is apparently steel, machinery and other industrial manufactures.

Table II-3-1 Balance of Trade

(million CFAF)

	1974	1975	1976	1977	1978
Export					
Groundnut products	33,877	40,310	64,473	75,509	20,481
Phosphates	24,946	22,226	15,513	14,971	13,081
Petroleum products	5,309	6,948	5,316	12,772	11,019
Cotton products	1,459	2,948	8,095	6,456	5,471
Sea products	7,172	7,262	11,028	16,456	17,664
Other items	21,210	19,407	11,500	26,806	17,193
Total	93,973	99,101	115,925	152,970	84,909
Import					
Foodstuffs	39,770	28,853	36,499	35,113	31,698
Petroleum products	15,479	14,782	19,004	23,380	18,516
Metals	2,228	2,148	3,895	2,132	6,830
Machines	9,866	17,827	14,477	19,590	27,865
Electrical goods	4,843	4,877	7,441	8,450	2,381
Cars/Trucks	4,407	7,176	13,182	12,625	10,583
Other items	42,789	48,953	59,389	86,257	66,832
Total	119,382	124,616	153,887	187,547	164,705
Balance	-25,409	-25,515	-37,962	-34,577	-79,796

Table II-3-2 Trade Volume

(tons)

	1974	1975	1976	1977
Export				
Groundnut products	300,596	519,379	759,377	661,217
Phosphates	1,898,040	1,515,915	1,616,319	1,861,344
Petroleum products	251,435	246,485	183,204	331,996
Cotton products	926	6,360	23,157	13,484
Sea products	33,003	35,184	39,964	61,227
Other items	446,000	386,334	480,378	374,510
Total	2,930,000	2,709,657	3,102,399	3,303,778
Import				
Foodstuffs	480,836	364,225	568,555	527,865
Petroleum products	718,600	720,283	754,506	814,559
Metals	16,230	6,057	3,507	4,151
Machines	10,227	18,276	15,880	14,188
Electrical goods	5,149	3,747	9,433	7,177
Cars/Trucks	5,194	10,860	16,212	13,958
Other items	283,762	288,375	364,789	454,962
Total	1,519,998	1,441,823	1,732,882	1,836,860

Table II-3-3 Balance of Trade by Partner in 1978

(million CFAF)

Trade partner	Export	Import	Balance
Germany, F.R.	2,046	7,910	- 5,864
Netherland	1,079	3,927	- -2,848
Switzerland	974	1,238	- 264
Luxemburg	-	2,982	- 2,982
France	35,597	68,395	-32,798
United Kingdom	4,783	5,967	- 1,184
Greece	2,397	-	2,397
Italy	1,196	6,902	- 5,706
Spain	-	3,189	- 3,189
Algeria	-	5,800	- 5,800
Mauritania	4,566	-	4,566
Mali	3,894	-	3,894
Ivoly coast	5,160	6,033	- 873
Nigeria	1,236	2,586	- 1,350
Japan	1,846	2,273	- 427
China	-	2,733	- 2,733
Pakistan	-	3,252	- 3,252
Dubai	-	2,666	- 2,666
Iraq	-	4,644	- 4,644
U. S. A.	-	13,420	-13,420
Brasil	-	3,688	- 3,688
Others	20,135	17,100	3,035
Total	84,909	164,705	-79,796

3-2 International Balance of Payments

Judging from some confirmed data and estimates about the country's trade account and tourist revenue in 1978, the resultant deficit is considerably large.

1978

Trade Balance	Deficit 79.8 Billion CFAF
Tourist Revenue	13.0 Billion CFAF
Balance	Deficit 66.8 Billion CFAF

Obviously this deficit was counterbalanced by transfer revenues, inward foreign investment and foreign aid. As things stand, Senegal will have to put up with this hard state of payments position in the years ahead.

4. Fifth Four-Year Plan for Economic and Social Development

4-1 Outline of Fifth Plan

Since its independence, Senegal has carried out successive four-year development plans. The fifth plan covering the 1977-81 period is currently under progress.

The long-term plan worked out in 1969 envisaged an average annual real growth rate of 6.5%. However, the actual growth averaged 1.5% in the years 1969-74 and 4.3% in the years 1974-77. The fifth plan sets the annual growth target lower at 5.8% for the 1977-81 period in consideration of the above mentioned facts. The plan gives top priority to the group of agriculture, fishery and livestock, which are followed by the group of mining, manufacturing and energy development. Total investments during the four-year period are estimated at 409.6 billion CFAF.

Table II-4-1 gives an outline of the fifth plan.

Table II-4-1 Outline of the Fifth Four-Year Plan for Economic and Social Development

(1) Target of Economic Growth (in 1969 CFAF)

	Average 68/69/70	1974	1977	1981	1987	2001
Gross domestic product(10^9)	227.9	245.3	278.4	348.8	437.1	1,713
Gross dom. income/P.C. (CFAF)	47,138	44,216	46,553	51,841	58,363	155,926
Gross dom. income/P.C. in US$	181	170	179	199	224	600

(2) Average Annual Rates of Growth (%)

	69/74	74/77	77/85	82/2001
Gross domestic product	1.50	4.3	5.8	8.9
Population	2.6	2.5	2.9	2.5
Gross dom. income per head	-1.3	1.7	2.9	6.3

(3) Financing Plan

Sector	Amount (million CFAF)	Share (%)
I. Primary	111,040	27.1
1) Agriculture	48,216	
2) Stock-farming	15,665	
3) Waterways and forests	11,891	
4) Fishing	28,347	
5) Rural water supplies	6,921	
II. Secondary	100,050	24.4
1) Energy	11,550	
2) Mines and industry	85,500	
3) Handicrafts	3,000	
III. Tertiary	75,663	18.5
1) Commerce	1,101	
2) Tourism	21,345	
3) Transport and telecom.	53,217	
IV. Quaternary	122,845	30.0
1) Town Planning open spaces	7,123	
2) Housing (rur. site drainage)	27,671	
3) Urban water sup. and sanit.	13,244	
4) Health	9,400	
5) Educ. & probationary train.	23,324	
6) Human promotion	2,063	
7) Culture	4,619	
8) Youth and sport	5,735	
9) Information	5,834	
10) Study and research	14,832	
11) Administrative equipment	9,000	
Total Fifth Plan	409,598	100.0

4-2 Progress in the Fifth Plan

As of the middle of 1979, 73% of all projects under the plan were attained in the public sector, where public financial aid is relatively abundant. The problem area is the private sector, where the attainment rate was low at 20%.

Senegal's state finance has been hard hit by increased foreign currency payments due to the second oil crisis of 1978 and global inflation and reduced revenues caused by the poor groundnut crops in the drought years.

Recently Senegal has been forced to borrow 30 billion CFAF in emergency loans from foreign sources and close down nearly one-half of its diplomatic establishments abroad. One of the pressing tasks for the Senegalese Government is to identify and carry out effective measures aimed at correcting the country's balance of payments position.

PART III SHIPPING SITUATION

1. Trend of Cargo Movement

1-1 Cargo Movement by Commodity

The seaborne cargo movements of Senegal's imports and exports are as follows. In 1977, exports totalled 2,700,000 tons and imports 1,850,000 tons. In 1978, exports totaled 2,350,000 tons and imports 2,100,000 tons. Compared to the preceding year, exports in 1978 decreased by 350,000 tons and imports increased by 250,000 tons. This was because a drought caused a drop in the exports of groundnuts and groundnut products and an increase in the imports of food.

Table III-1-1 Cargo Movement by Port

(1000 tons)

Port	Export		Import	
	1977	1978	1977	1978
Dakar	2,500	2,250	1,770	1,990
(Transit cargo from or to Mali)	(56)	(45)	(9)	(73)
Kaolack	180	90	-	-
Ziguinchor	10	10	80	100
Saint-Louis	5	5	5	5
Total	2,695	2,355	1,855	2,095

Dakar is geographically situated at an important point in Atlantic maritime transportation and plays a big role as a bunkering port. Consequently, although Senegal is a non-oil producing country, oil exports are recorded in its statistics. There are also cases in which marine products landed by fishing vessels are recorded as imports. Moreover, transit cargo to the land-locked country of Mali is included in the above statistics.

Cargo movement broken down by commodity such as tanker cargo, dry bulk cargo, etc. is given in Table III-1-2.

Table III-1-2 Cargo Movement by Commodity

(1000 tons)

Cargo	Export		Import	
	1977	1978	1977	1978
Groundnut oil	170	70	-	-
Petroleum products	-	-	800	800
Tanker sub-total	170	70	800	800
Phosphates	1,820	1,740	-	-
Groundnut oil cake	310	140	-	-
Grain/Sugar	-	-	550	770
Dry bulk sub-total	2,130	1,880	550	770
Others	395	405	505	525
Total	2,695	2,355	1,855	2,095

Tanker cargo and dry bulk cargo, consisting principally of phosphate, groundnuts oil cake and groundnuts oil, account for a high proportion of exports. The proportion of the same type of cargo such as oil, grain and sugar is also high for the import.

1-2 Cargo Movement by Region and by Route

1-2-1 Altantic Coast of Europe and Northern Europe
(COWAC and UKWAL Area)

Transactions in this area account for roughly 60% of Sengal's export cargo movement and for roughly 35% of its import cargo movement. The major export cargo are phosphate, groundnuts oil and groundnuts oil cake. About 60% of imports are oil and 40% are general cargo. General cargo exported by liner trade amount to approximately 50,000 tons, with the main destination being France. General cargo imported by liner trade amount to about 300,000 tons, mainly from France, the Netherlands and Belgium.

Table III-1-3 Cargo Movement by Trade Partner in Atlantic Coast of Europe and Northern Europe

(1000 tons)

Country	Export		Import	
	1977	1978	1977	1978
France	840	480	304	250
Belgium	4	3	51	62
Netherland	164	188	263	263
Germany, F. R.	19	13	28	22
U. K./Ireland	524	473	69	43
Northern Europe	171	173	9	10
Total	1,722	1,330	724	650

1-2-2 Southern Europe (MEWAC Area, Including Mediterranean side of France)

Transactions in this region account for about 20% of exports and for about 10% of imports. Here also the main exports are phosphate, groundnuts oil and groundnuts oil cake. Import items are petroleum products from Marseilles and fresh foodstuff. Movement of general cargo is 30,000 tons exports and 100,000 tons imports.

Table III-1-4 Cargo Movement by Trade Partner in Southern Europe

(1000 tons)

Country	Export		Import	
	1977	1978	1977	1978
France	152	108	130	108
Portugal	56	50	55	1
Spain	16	13	38	26
Italy	52	36	75	83
Greece	230	205	1	2
Total	506	412	299	220

1-2-3 Others

In 1978, there was a big increase in cargo movement to Eastern Europe and the USSR because of phosphate movements to Yugoslavia.

The main trade with Asia are phosphate exported to Japan and India and rice imported from Thai, Pakistan, etc.

About 90% of the export to African region constitute trade with the countries of West Africa, with the main items being rock salt and cement. For the case of import from African region, the greater parts are trade with West African countries, with lumber and foodstuff being the principal items.

In trade with the North and South American continents, there are hardly any exports whereas imports of food such as wheat and sugar are increasing steeply.

Trade with Oceania was almost non-existent, but in 1978 food imports from Australia were recorded.

Table III-1-5 Cargo Movement by Region Other than Western Europe

(1000 tons)

Region	Export		Import	
	1977	1978	1977	1978
Eastern Europe/U.S.S.R.	10	85	42	64
Asia	164	235	185	170
Africa	278	276	219	345
North and South America	15	17	386	636
Oceania	-	-	-	10
Total	467	613	832	1,225

2. Liner Shipping Service related to Senegal

With respect to cargo movements of liner trade related to Sengal, imports are mainly from the Atlantic Coast of Europe, namely Antwerp/Bordeaux Range, followed by Mediterranean Europe. It is the same with exports.

2-1 Senegal/Atlantic Coast of Europe Trade

For operators of liner service in the Continent/West Africa trade, the Gulf of Guinea between Abidjan and Matadi is the focal area on the West African end. Many of the ships in this trade call at Dakar despite the small

volume of cargo because they do not have to deviate from their route.

The type of ships assigned to this trade are bascially the three following types:

(a) Container ships equipped with cranes
(b) Multi-purpose vessels which can carry containers and break bulk cargoes
(c) Conventional vessels

The full container service in this trade is shown below.

Full Container Service of the Atlantic Coast of Europe/West Africa

Name of Operator/Group	Particulars of Service
SNCDV[1)]	Weekly service with four container ships (carrying about 1,000 containers)
SCADOA Group[2)]	Weekly service with six container ships/semi-containerized ships
Palm/Elder[3)]	Weekly service with four container ships (carrying about 700 containers)
EAC[4)]	Fortnightly service between Scandinavia/France Range and West Africa with two container ships (carrying 1,000 containers)

Notes: 1) SNCDV (Societe Navale Chargeurs Delmas-Vieljeux, Paris) is the biggest French operator in the Europe/West Africa trade.

2) SCADOA (Service Commun d'Armements Desservant l'Ouest Africain) is the name of joint service by the following members of the COWAC freight conference: Hoegh Lines, Oslo/Nedlloyd Lines, Rotterdam/Societe Navale de l'Ouest, Paris/The Scandinavian West Africa Line, Goteborg.

3) Palm/Elder; Palm Line/Elder Dempster Lines are large British liner operators.

4) EAC (East Asiatic Co., Copenhagen) is a Danish shipping company with strong connections in the Africa, Far East/Europe trade.

For the semi-container service, operators have assigned 13,000-17,000 ton multi-purpose vessels to this trade. Especially the national lines in West Africa, SITRAM of Cote d'Ivoire, CAMSHIP of Cameroun and NNSL of Nigeria have assigned latest multi-purpose vessels to this trade offering semi-container service.

In the conventional service, vessels of about 10 years old are being used.

The table below shows the number of sailings of each type in service from Europe to Dakar in the two months of July and August, 1980.

Type of Service	Nos. of Sailing 1980/Jul	Aug.
Full-container Service	10	7
Semi-container Service	5	3
Conventional Service	13	12
Total	28	22

Container ships call at about five European ports among Hamburg, Rotterdam, Antwerp, Dunkerque, Rouan, Le Havre and Bordeaux and at 4-5 West African ports among Dakar, Abidjian, Lome, Apapa, Douala, and Port Gentil. They use 48/49 navigation days per round trip. Semi-container ships and conventional vessels follow the same pattern as container ships on their southbound trips. On the northerbound trips, however, the ports of call both in West Africa and Europe are limited in order to maintain a quick turn-around.

The shipping schedule of each type is shown in Fig. III-2-1.

Fig. III-2-1 Examples of Shipping Schedule in West Africa/ Atlantic Coast of Europe Trade

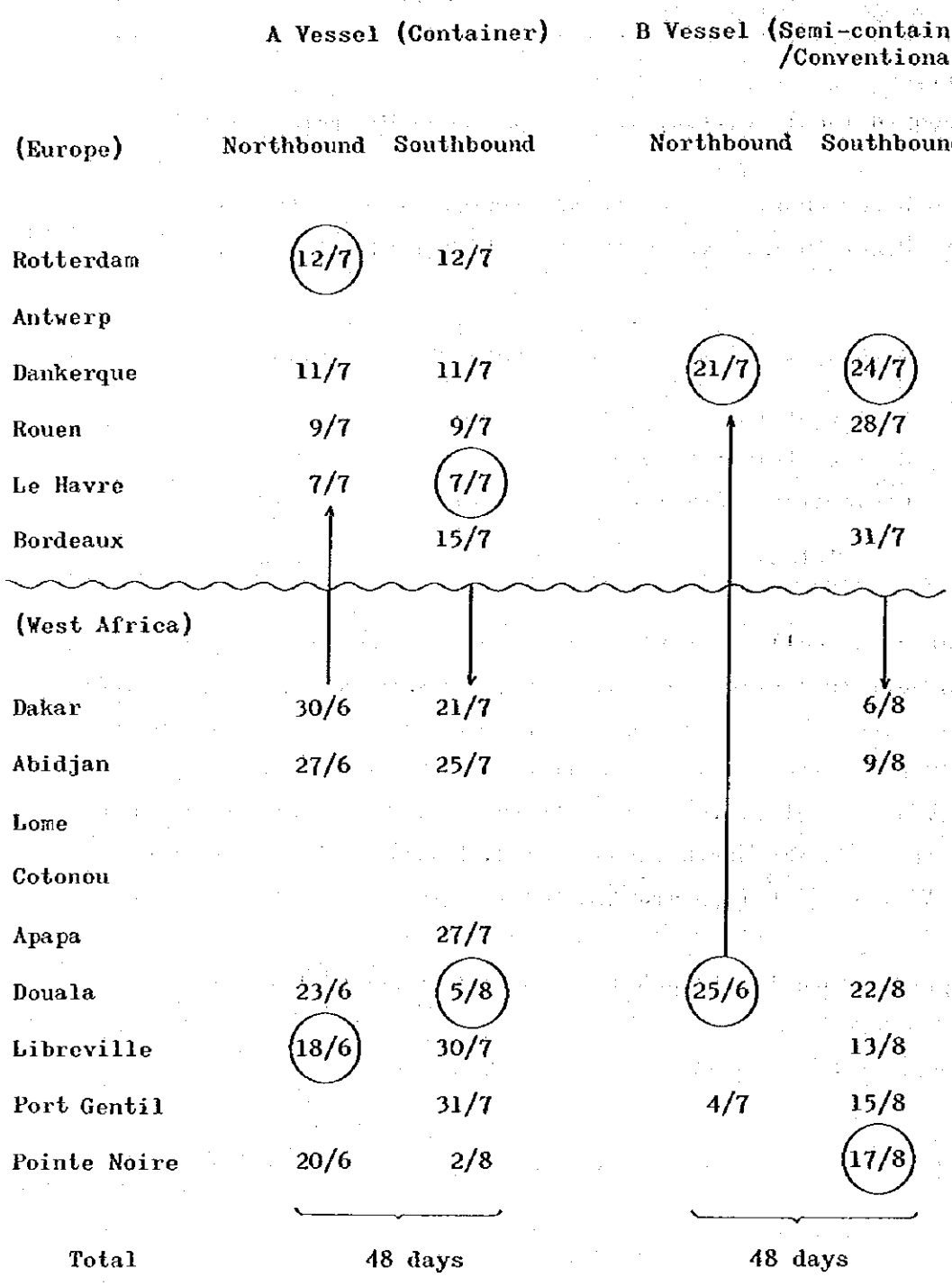


Table III-2-1 European Fleet assigned to COWAC Trade

Operater	Vessel	Built	Type	D/W	Container Space
CNDF	Saint Paul	1970	M	17,693	410
	Saint Franceis	"	M	"	"
CMB	Aramis	1970	T	15,175	-
	Jordaens	1963	T	12,723	-
	Monarch	1971	T	16,618	-
DAL	Polana	1968	T	12,740	-
	Pelindaba	1970	T	"	-
	Pedane	"	T	"	-
	Alpina	"	T	14,981	-
	Gretke Oldendarf	1973	T	16,300	-
	Ulanga	1977	C	13,879	550
	Ulundi	"	C	"	"
	Usanbara	"	C	14,103	"
	Regina	1978	T	11,200	-
	Sloman Najade	"	T	10,000	-
	Sloman Mercur	1979	M	13,130	543
DSR	Stollberg	1969	T	6,950	-
	Furstenberg	1971	T	6,950	-
EAC	Fiona	1978	C	19,149	1,078
	Boringia	"	C	19,149	1,078
ELDER	Lycaon	1976	T	13,447	-
	Melampus	1977	M	21,618	773
HOEGH	Hoegh Banniere	1979	Ro/Ro	17,500	?
NEDLLOYD	Nedlloyed Rijni	1962	T	11,718	-
	" Rohne	"	T	11,863	-
	" Nile	1972	T	12,403	-
PALM	Apapa Palm	1973	M	11,618	226
	Badagry Palm	1979	M	16,525	732
POL	Torun	1966	T	5,984	-
SNCDV	Leonce Vieljeux	1970	T	16,000	-
	Christian "	"	T	16,000	-
	Pierre "	"	T	16,000	-
	Saint Francois	"	M	17,693	410
	Georges Vieljeux	1971	T	16,000	-
	Cotes du Nord	1973	T	15,850	-
	La Pollice	1975	M	17,636	544
	Irma Delmas	1978	C	24,946	921
	Helene "	"	C	24,946	921
	Lucie "	"	C	24,946	921
	Marie "	"	C	24,946	921

* Vessel Type: T - Conventional M - Multi-Purpose C - Container

Table III-2-2 West African National Lines' Fleet assigned to COWC Trade

Operater	Vessel	Built	Type	D/W	Container Space
COBENAM	Ganvie	1970	M	4,399	170
	Gert Staerke	1977	T	4,100	-
CAMSHIP	Cam Doussie	1977	M	13,208	331
	" BuBinga	"	M	13,208	436
	" Iroko	1979	M	16,500	605
	" Ilomba	"	M	16,500	605
NNSL	River Ethiope	1969	T	10,811	-
	" Rima	1979	M	11,742	262
	" Osse	"	M	11,786	262
	" Oji	"	M	16,487	428
	" Majidun	"	M	16,333	428
SITRAM	Yamoussoukro	1977	M	16,746	353
	Agboville	"	M	16,746	353
	Jacqueville	"	M	16,746	353
	Yakasse	1978	M	16,746	353
SONATRAM	Saronic	1979	T	8,327	-
SOTONAM	Pic D'Agou	1978	M	11,690	464

Operaters' Name:

CMB : Compagnie Maritime Belge, Belgium
CNDF : Compagnie de Navigation Denis Freres, France
DAL : Deutsche Afrika Linien GmbH, West Germany
DSR : V.E.B. Deutfrachat Seereederei, East Germany
EAC : The East Asiatic Co., Ltd., Denmark
ELDER : Elder Dempster Lines Ltd., United Kingdom
HOEGH : Leif Hoegh & Co., Norway
NEDLLOYD : Nedlloyd Lijnen B.V., Netherland
PALM : Palm Line Ltd., United Kingdom
POL : The Plish Ocean Lines, Porland
SNCDV : Societe Navale Chargeurs Delmas-Vieljeux, France
COBENAM : Compagnie Beninoise de Navigation Maritime, Benin
CAMSHIP : The Cameroon Shipping Lines, Comeroon
NNSL : The Nigerian National Shipping Line Ltd., Nigeria
SITRAM : Societe Ivorienne de Transports Maritime, Ivorycoast
SONATRAM : Societe National de Transport Maritime, Gabon
SOTONAM : Societe Togolaise de Navigation Maritime, Togo

2-2 Senegal/Mediterranean Europe Trade

On the Mediterranean Europe trade which is next in importance to the Atlantic Coast of Europe in Senegal's foreign trade, a joint operating group of three companies, also Nautilus have assigned Roll on Roll off (Ro/Ro) ships which can carry containers, break bulk cargo and motor cars. SNCDV operates a full container service in this trade also. The monthly Senegal-bound number of sailings is as follows:

Type of Service	Nos. of Sailing
Container Service	3
Ro/Ro Service	7
Conventional Service	14
Total	24

The ships assigned by all operators are mainly 3,000-5,000 tonner small types.

2-3 Senegal/United Kingdom Trade

In the United Kingdon trade, the UKWAL Joint Service operates semi-container ships calling twice every month at Dakar. The United Kingdom's main trading partners in West Africa are Nigeria and Zaire.

3. Senegal-related Shipping Conferences

Senegal-related shipping conferences or agreements are roughly divided by area into (a) Atlantic Coast of Europe, (b) United Kingdom, (c) Mediterranean Europe, (d) North America and (e) Far East. The principal shipping conferences are outlined below. (See Table III-3-1).

3-1 Continent West Africa Conference (COWAC)

COWAC is a conference which links the Atlantic Coast of Europe with West Africa and has as many as 25 member lines, the largest number among Senegal-related shipping conferences. Almost all the national lines (8 lines) of West Africa are members of the conference. It is divided into the northern section (north of Belgium) and the southern section (France). In June 1980, COSENAM joined the conference as Senegal's national line.

Name of Conference	Area	Members
Mediterranean Europe West Africa Conference (MEWAC)	From the southern border between Spain and Portugal to the southern border between Yugoslavia and Alabania, including all ports in Spain, Mediterranean France, Italy and Yugoslavia on the mainland and all islands excluding Malta and Gibraltar to the area from the northern border of Mauritania to the southrn border of Angola including Cape Verde Islands, Biyogo, Sao Tome and Principe and vice versa.	Achille Lauro Line Black Star Line Cameroon Shipping Lines Comaran Africa Line Compagnie Maritime Zairoise Express Navigation Keller Shipping (Nautilus Line) Linea Transmare S.N.p.A. Lloyd Triestino Marasia Maurel et Prom Nigerbras (Lagos) Nigerian National Shipping Line Ltd. Societe Naval Chargeurs Delmas-Vieljeux (S.N.C.D.V.) Sitram (Societe Ivoirienne des Transports Maritimes) Sivomar (Societe Ivoirenne de Navigation Maritimes) Splosna Ploba (Piran)
United Kingdom/West Africa Lines Joint Service (UKWAL)	To and from ports in the United Kingdom and Eire and ports in West Africa (Nouadhibou to Mocamedes both inclusive).	Elder Dempster Lines Ltd. Palm Line Ltd. The Guinea Gulf Line Ltd. State Shipping Corporation (Black Star Line) The Nigerian National Shipping Line Ltd. Hoegh Lines Compagnie Maritime Zairose

Name of Conference	Area	Members
Continent West Africa Conference (COWAC) - Northern Section	To and from North Cape/Belgium range ports, including all ports in the Baltic Sea, and West African ports in the Mauritania/Congo Republic (Brazzaville) range.	C.M.B. Compagnie Beninoise de Navigation Maritime Compagnie Maritime Zairoise Compagnie de Navigation Denis Freres Deutsche Afrika Linien GmbH (Woermann Linie) Elder Dempster Lines Ltd. Guinea Gulf Line Hoegh Lines, Leif Höeg & Co. A/S Nedllyod Lijnen B.V. (Nedlloyd Lines) Nigerian National Shipping Line Ltd. Palm Line Ltd. Societe Ivorienne de Transports Maritime Societe Maritime Atlantique du Togo Societe Nationale de Transporte Maritime Societe Navale Chargeurs Delmas-Vieljeux Societe Navale de l'Ouest Compagnie Senegalaise de Navigation Maritime (COSENAM) The Cameroun Shipping Lines The East Asiatic Co. Ltd. The Estonian Shipping Co. The Nigerian National Shipping Line Ltd. The Polish Ocean Lines The Scandinavian West Africa Line The State Shipping Corporation of Ghana (Black Star Line, Ltd.) V.E.B. Deutfracht/Seereederei, Rostock

Name of Conference	Area	Members
Mediterranean Europe West Africa Conference (MEWAC)	From the southern border between Spain and Portugal to the southern border between Yugoslavia and Alabania, including all ports in Spain, Mediterranean France, Italy and Yugoslavia on the mainland and all islands excluding Malta and Gibraltar to the area from the northern border of Mauritania to the southrn border of Angola including Cape Verde Islands, Biyogo, Sao Tome and Principe and vice versa.	Achille Lauro Line Black Star Line Cameroon Shipping Lines Comaran Africa Line Compagnie Maritime Zairoise Express Navigation Keller Shipping (Nautilus Line) Linea Transmare S.N.p.A. Lloyd Triestino Marasia Maurel et Prom Nigerbras (Lagos) Nigerian National Shipping Line Ltd. Societe Naval Chargeurs Delmas-Vieljeux (S.N.C.D.V.) Sitram (Societe Ivoirienne des Transports Maritimes) Sivomar (Societe Ivoirenne de Navigation Maritimes) Splosna Ploba (Piran)
United Kingdom/West Africa Lines Joint Service (UKWAL)	To and from ports in the United Kingdom and Eire and ports in West Africa (Nouadhibou to Mocamedes both inclusive).	Elder Dempster Lines Ltd. Palm Line Ltd. The Guinea Gulf Line Ltd. State Shipping Corporation (Black Star Line) The Nigerian National Shipping Line Ltd. Hoegh Lines Compagnie Maritime Zairose

Name of Conference	Area	Members
West Africa (Nigeria/Senegal Range) Far East Freight Conference	From West African ports (Nigeria/ Senegal Range) to ports of West Malaysia, Singapore, Hong Kong, Taiwan, South Korea and Japan.	Cie. Maritime des Chargeurs Reunis Gold Star Line Ltd. Kawasaki Kisen Kaisha Ltd. A.P. Moller - Maersk Line Mitsui O.S.K. Lines Ltd. Nippon Yusen Kaisha Cie. Maritime Zairoise
American-West African Freight Conference	Service Eastbound and Westbound to and from US Atlantic and Gulf ports and Canadian Atlantic and St. Lawrence River ports not West of Montreal and West African ports South of the southerly border of Rio de Oro Spanish Sahara, and North of the northerly border of South-West Africa, including the islands of the Azores, Madeiras, Canary, Cape Verdes and Biyogo. Principe and Sao Thome in the Gulf of Guinea.	Barber Lines A/S Black Star Line Ltd. Compagnie Maritime Zairose S.A.R.L. (CMZ) Companhia Nacional de Navegacao (CNN) Concordia Line Delta Steamship Line, Inc. Elder Dempster Lines, Ltd. Farrell Lines Incorporated Medafrica Line SITRAM Torm West Africa Line Uiterwyk Shipping Lines Westwind Africa Line

3-2 Mediterranean Europe West Africa Conference (MEWAC)

MEWAC is a conference which links Mediterranean Europe with West Africa and is composed of 17 lines, including five national lines of West Africa.

3-3 United Kingdom/West Africa Lines Joint Service (UKWAL)

UKWAL is a pool account conference which links the United Kingdom with West Africa. Seven Member lines have pool arrangements, rationalizing shipping schedules and allocation of calling ports. Sengal loading/unloading account for only about 1% of total UKWAL trade.

4. National Shipping Lines in West Africa

4-1 West African Nations and National Shipping Line

From a global point of view, one feature of the maritime policy in the West African zone, is that, like those in the Latin American zone, the countries have recently been pushing forward development of their national lines as first priority project backuped by the governmental actions of cargo reservation for their national lines. At the Ministerial Conference of the West and Central African States on Maritime Transport, held in 1975 in Abidjan, the West African nations adopted a permanent cooperation charter on maritime transport, commonly called then "Abidjan Charter". The charter recommends that every nation establish and expand its own national line. This recommendation is being implemented in respective countries.

Of the 18 countries located on the coast of the Atlantic Ocean extending from Senegal to Angola, nine countries maintain their own national line which is actually operating ships for liner service.

The presence or absence of a national line in West African countries is shown in Table III-4-1, together with the cargo movements and economic scale of each country.

Liner service is provided by a national line in all of the first 10 nations ranked in the order of import cargo movements (headed by Nigeria) except Senegal and Liberia.

Fig. III-4-1 West African Nations and National Shipping Line

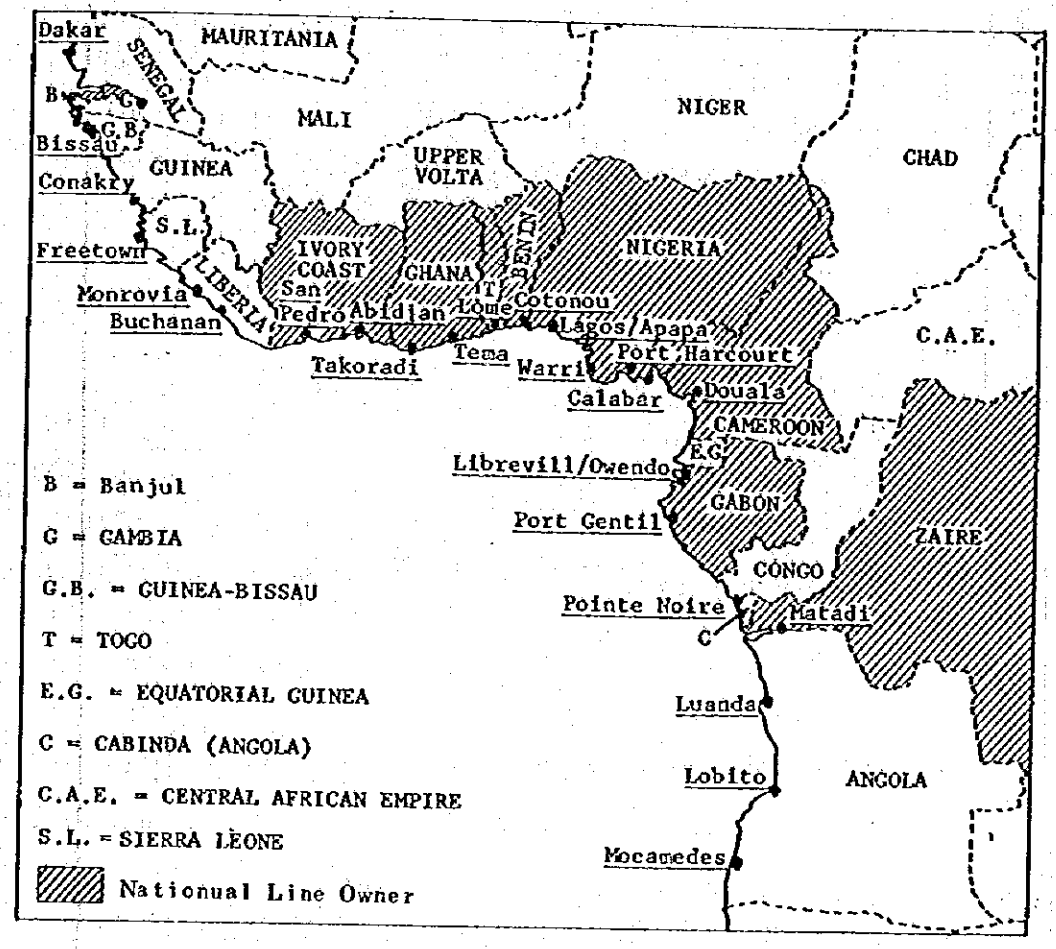


Table III-4-1 Economic and Shipping Situation of West African Countries

NATION	NON FUEL CARGO UNLOADED		GNP		POPULATION		National Line
	(1,000 tons)	RANK	(1 million US$)	RANK	(million persons)	RANK	
Nigeria	6,612	1	29,320	1	77.1	1	YES
Ivory Coast	2,878	2	4,280	3	7.0	5	YES
Ghana	2,810	3	5,920	2	10.1	3	YES
Senegal	1,208	4	1,980	6	5.2	8	(YES)
Cameroon	950	5	2,240	5	7.6	4	YES
Gabon	947	6	1,410	8	0.5	14	YES
Zaire	749	7	3,510	4	25.4	2	YES
Liberia	683	8	720	10	1.6	12	NO
Benin	635	9	430	14	3.2	9	YES
Togo	407	10	600	13	2.3	11	YES
Congo	375	11	700	11	1.4	13	NO
Guinea	332	12	880	9	5.7	6	NO
Sierra Leone	312	13	610	12	3.1	10	NO
Angola	182	14	1,830	7	5.5	7	NO
Gambia	62	15	100	16	0.5	14	YES
Gainea-Bissau	25	16	70	17	0.5	14	NO
Sao Tomee Principe	12	17	40	18	0.1	18	NO
Equatorial Guinea	4	18	110	15	0.3	17	NO

Note Figures of Cargo, GNP and Population are as of 1976.

4-2 Outline of National Lines of West African Nations

4-2-1 Nigeria-The Nigerian National Shipping Line, Lagos (NNSL)

NNSL is Nigeria's 100% state-owned company and extends its service in five directions: Southern and Northern Europe, Britain, the Mediterranean Sea and the Far East. It is the largest liner shipping company in West Africa and provides a full container service jointly with British shipowners, Black Star (Ghana's national line) and CMZ (Zaire's national line) on the UKWAL trade (UK/West Africa). NNSL owns 18 ships, ranging from 6,000-tonner conventional vessels to 16,000-ton latest multi-purpose vessels. NNSL ordered ships from South Korea and Yugoslavia. In 1981, when the delivery of vessels is completed, the nationally owned tonnage of NNSL is expected to reach 30.

4-2-2 Ivory Coast — Societe Ivorienne de Transport Maritime, Abidjan (SITRAM)

SITRAM is Ivory Coast's 100% state-owned company which used to operate seven 7,000-ton older vessels. In 1977, the company placed orders with Japanese and Spanish shipbuilders for new ships. It now owns nine 13,000-16,000-tonner modern multi-purpose vessels and has plans to order 10 or more ships in 1980. SITRAM's service extends in three directions: Europe, the Mediterranean Sea and North America. Its business results have been very good and are hailed as the latest instance of success of the national shipping line in West Africa.

4-2-3 Ghana - Black Star Line Accra

Black Star is Ghana's state-owned company which owns 16 ships. Black Star operates ships in the UK/West Africa trade UKWAL joint service.

4-2-4 Senegal - Compagnie Senegalaise de Navigation Maritime (COSENAM)

COSENAM was established in October 1979 as the national line of Senegal by the joint efforts of the public and private sectors of the country. Its predecessor SENAM, established in 1976, was dissolved in the autumn of 1979, as a result of its unsuccessful partnership with foreign capital over a joint investment. COSENAM has no owned tonnage yet, but plans to start a liner service between Dakar and the Atlantic coast of Europe by using chartered vessels from the autumn of 1980 onward.

4-2-5 Cameroon - Cameroon Shipping Lines S.A., Douala (CAMSHIP)

CAMSHIP is Cameroon's national line whose shares are divided between the Cameroon Government (two-thirds) and a West German shipowner (one-third). The company provides a service between Europe and West Africa by using a total of six vessels: three 6,000-7,000 ton conventional vessels and three 16,000 tonner multi-purpose vessels.

6-2-6 Benin - Compagnie Beninoise de Navigation Maritime, Contonou (COBENAM)

COBENAM is Benin's national line which provides a liner service between Europe and West Africa with one owned vessel and one chartered vessel.

4-2-7 Togo - Societe Togolaise de Navigation Maritime, Lome (SOTONAM)

SOTONAM owns two multi-purpose vessels built in 1978 and provides a semi-container service between Europe and West Africa jointly with operators in France and West Germany.

4-2-8 Gabon - Societe Nationale de Transports Maritimes, Libreville (SONATRAM)

SONATRAM owns three 5,000-tonner conventional vessels and provides services between Europe and West Africa and between the Mediterranean Sea and West Africa.

4-2-9 Zaire - Compagnie Maritime Zairoise, Kinshasa (CMZ)

CMZ, together with Belgium's national line CMB (Compagnie Maritime Belge, Antwerp), operates a joint semi-container service between Europe and West Africa. It also operates ships to Britain, the Mediterranean Sea and North America. It now owns 10 ships and still has enormous potential in view of Zaire's economic capacity.

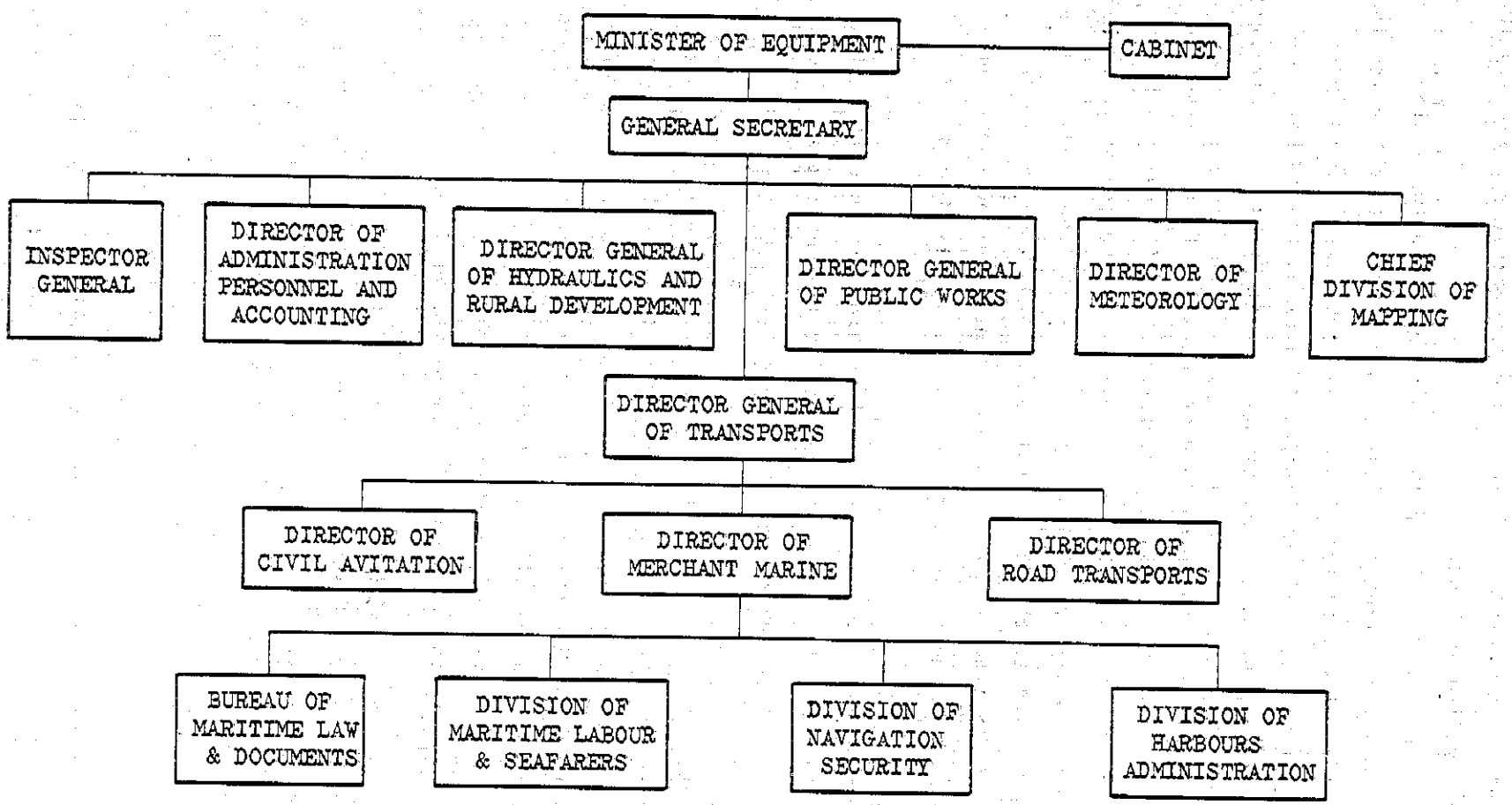
4-2-10 Gambia - Gambia National Line, Banjul

It is understood that Gambia National Line may have recently started a liner service between Gambia, Sierra Leone and Britain.

5. Maritime Administration

Senegal's maritime administration is under the control of the Ministry of Equipment with the Director of Merchant Marine of the Ministry in direct charge.

Fig. III-5-1 Organization Chart on Maritime Administration



Basic laws concerning maritime transport are adequately provided in the Merchant Marine Act enacted in 1962.

Of particular note in connection with this program are two actions taken by Senegal; its ratification at an early date (1977) of the Convention on a Code of Conduct for Liner Conferences and its participation in the Ministerial Conference of the West and Central African States on Maritime Transport. The convention specifies the trade share in the liner conferences and shippers' participation in the procedure of adjusting freight rates in the liner conferences. The Ministerial Conference urges the establishment and expansion of national lines, drawing its ideas from the convention, whilst uniting the shippers' councils of member nations to establish a negotiating committee as a counterpart to the liner conferences and, thus, promoting negotiations between the liner conferences and the negotiating committee. Senegal is represented in the Ministerial Conference by its Ministre de l'Equipment.

Domestically, Senegal's lays relating to the shippers' council include protection clauses for shippers interests concerning freight rates and clauses to the effect that 40% of the nation's own cargoes are to be reserved for the national line.

The development of the national shipping line is presently the most important issue in the maritime transport policy of the country and is being vigorously urged to progress as a national project. And it is placed under the control of the Director General of Transports of the Ministry of Equipment as it is necessary to coordinate with many sectors to materialize this project. The Director of Merchant Marine of the Ministry takes part, as a member of the board, in COSENAM which is the main coordinator of the project.

6. Senegal Shippers' Council

6-1 Objectives and Organization

In conformity with the law which was enacted in April, 1975, the Senegal Shippers' Council (Conseil Sénégalais des Chargeurs : COSEC) was established as a public organ. At first the following were set forth as the objectives of COSEC: To formulate and promote policies to protect the interests of Senegalese exporters and importers with regard to various matters concerning marine transport. To regulate freight rates, and to achieve fair allotment of cargoes and fair practice in other marine transport activities. Later, as the Convention on a Code of Conduct for Liner Conferences was incorporated in the Senegalese law, two items were added to the objectives of the COSEC: To secure a 40% trade share for its national line, and to put the resolution on determination of freight rates, which was made at the Ministerial Conference of West and Central Africa on Maritime Transport, into practice in Senegal.

The COSEC is composed of 13 legal members, including proxies of the competent ministers and representatives of public organizations concerning commerce and industry, and about 1,500 exporters and importers in Senegal. The Council is operated with funds consisting of 0.3% dues on trade amount which are collected from exporters and importers through the customs and tax offices in the country into the special account of the national treasury and the annual membership fee of 10,000 CFAF per member company. All exporters and importers are compelled by law to join the COSEC, and no trader is authorized to handle export and import cargoes in Senegal without the shipper's card issued by the Council.

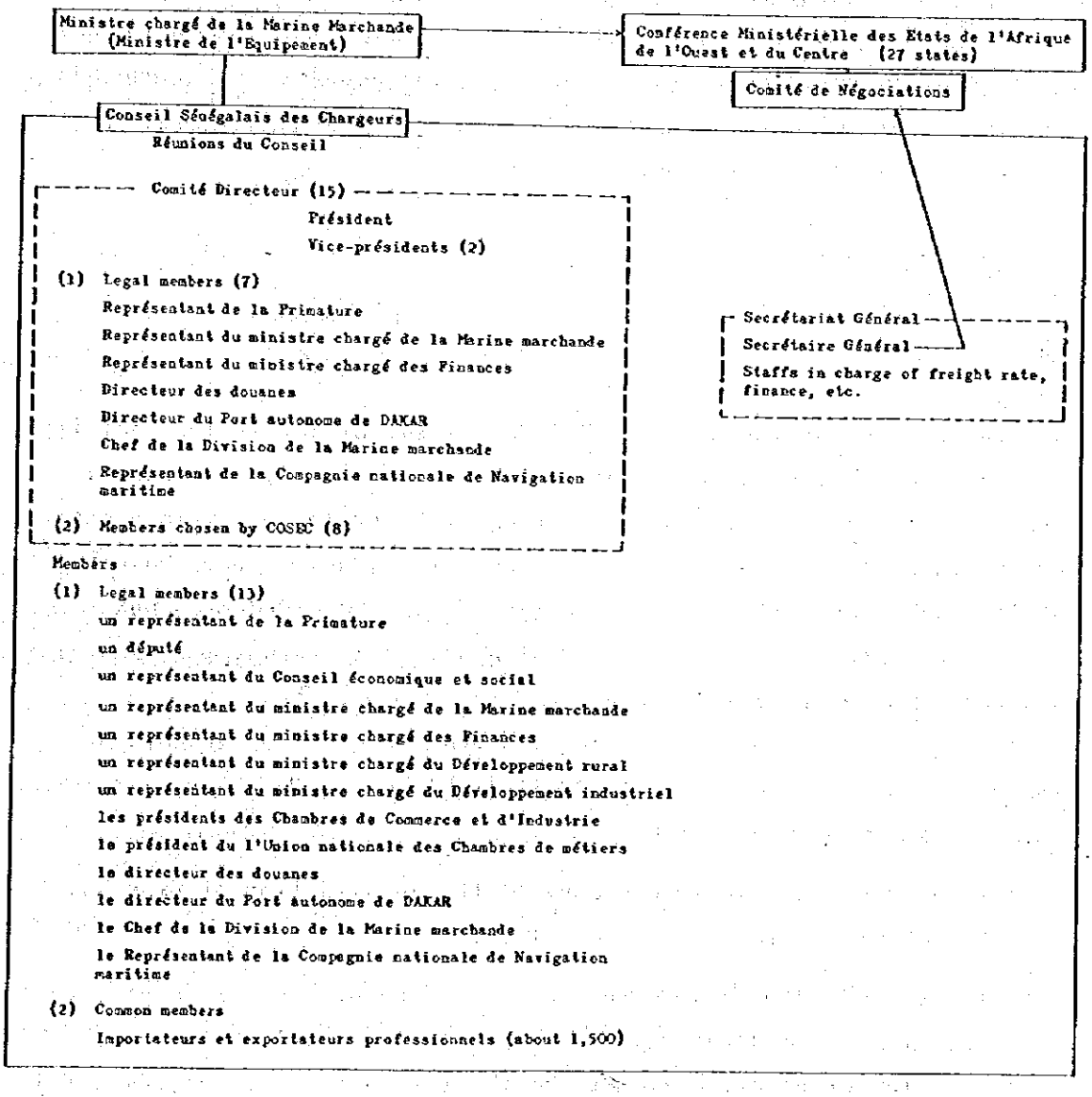
The COSEC is organized under the control of Minister of Equipment (Ministre de l'Equipement) with the committee of directors composed of 15 members as its executive body. The co-ordinator of the Council's internal and external activities is the Secretary-general (Secrétaire Général) who is nominated by the committee of directors and is appointed by Minister of Equipment and Minister of Finance (Ministre des Finances et des Affaires économiques).

6-2 Activities

To fulfill its function to execute in Senegal the Convention on Liner Conferences and the resolution of the Ministerial Conference of West and Central Africa on Maritime Transport, the COSEC enforces and export/import licensing system premised on securing of cargoes for Senegalese shipping.

Under this system, the law obliges agents of foreign shipping lines to submit cargo manifests related to trade with Senegal to the COSEC every fortnight, and compels exporters and importers to submit to the Council monthly cargo statistics by ship, shipping company and export/import route. It is also provided for in the law that freight rates for cargoes to and from Senegal should be negotiated with the COSEC or the Negotiating Committee of the Ministerial Conference of West and Central Africa on Maritime Transport. If any carrier raises freights one-sidedly, it would be charged a 200% surtax based on the port tax tariff. It any exporter or importer violates the laws concerned, he is left off with a warning at the first offence. At the second offence in one fiscal year, however, he is punished with suspension of his shipper's card for three months, and at the third offence in the same year, with its abolishment for six months.

Fig. III-6-1 Organization of COSEC



7. Port Conditions

Historically, Saint-Louis, the northernmost part of Senegal, developed first of all in this country as a French base. Next, Dakar grew as a center of administrative and other activities. Today, in trade with foreign countries, Dakar has a monopoly position as a port of unloading general consumer goods and machinery and of loading phosphate. Major ports of loading groundnut products are Kaolack and Ziguinchor.

7-1 Dakar (lat. 14°40' N, Long. 17°24' W)

7-1-1 History of Dakar

Dakar is situated on the southside of Cape Verde at the westernmost tip of the African Continent which has been well known to West Africa coastal navigators as a good landmark. The port of Dakar is protected by this cape from rough waves of the Atlantic. From ancient times, seamen used Gole Bay on Gole Island as an anchoring point. In 1857, France decided that Dakar should be its entrance into the African Continent. Afterwards, port facilities were constructed in the following sequence:

- The program of 1864 to 1866 which allowed the construction of the present Southern Jetty, the landfall light on the Mamelles, and the Almadie and Cape Manuel lights.
- The program of 1904 to 1910 comprised the construction of Pier No. 1 and 2 each with a length of 300 meters.
- The program of 1910 to 1926 for the provision of a water supply, the running of roads and railways to the port, the erection of sheds, the installation of electric light, and the purchase of cranes, tugs and launches.
- The program of 1926 to 1933 for the construction of Pier No. 5, 6 and 8, the installation of two oil bunkering points at the Northern Jetty.
- The program of 1933 to 1939 for the erection of Pier No. 3.
- After the Second World War this development was to continued by the construction of Pier No. 4 from 1947 to 1951, of the Oil Wharf in 1954, of a first fish wharf in 1962 and a second in 1972.

7-1-2 Port Facilities

For loading and unloading general cargoes, the port has 15 berths on piers No.1 to 3 in the south port area. The piers No.4 to 8 in the north port area are for handling principal cargoes, such as for loading phosphate and groundnut products and for discharging logs. The pier No.9 and the North Jetty are for handling petroleum. Descriptions of the piers are as shown in Table III-7-1.

7-1-3 Port Agents

In the software aspect of port facilities, Dakar has port agents of each type functioning properly. Table III-7-2 gives an outline of their services.

7-2 Kaolack (Lat. 14°08' N, Long. 16°04'30" W)

Kaolack is a port of loading groundnut oil and cake situated at about 112 km upstream from the mouth of the Saloum River. This port has a quay 636 metres long where the depth of water is 4 metres. However, the maximum length of the ship that can sail up and down the Saloum is 105 metres. Usually, ships are lifting groundnut products at Kaolack or Ziguinchor up to the maximum permissible draught and are topped up at Dakar.

7-3 Ziguinchor (Lat. 12°35' N, Long. 16°20' W)

Like Kaolack, Ziguinchor is also a port of loading groundnut products. It is situated at about 50 kilometres upstream the Casamance River. The depth of water is about 5 metres at the mouth of the river, and a little over 8 metres around the quay in the port.

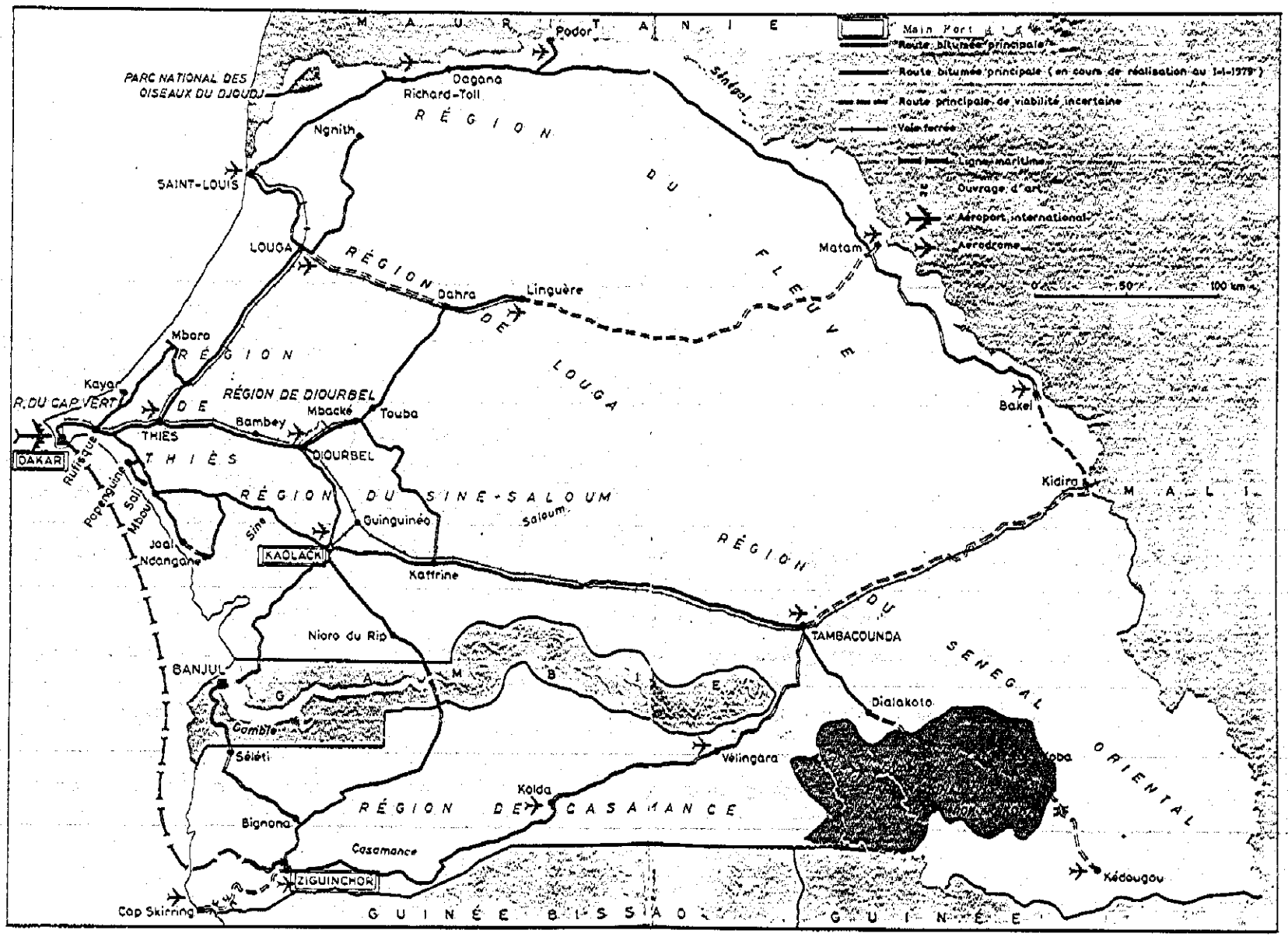
Table III-7-1 Port Facilities of Dakar

Zone	Pier	Berth	Length	Max. Draft	Cargo	Handling Speed	Remarks
SOUTH AREA	No.1	No.11-17	1,074m	8.5-10m	General Cargo, Container	10-15 tons/hour/gang	4 closed sheds, 18,700m^2
	2	21-25	683	10	General Cargo	"	" , 2,080m^2
	3	31-33	340	10	General Cargo, Cement, etc.	"	1 closed shed, 2,080m^2 (assigned for Mail's cargo)
NORTH AREA	4	41-45	572	7.0-10.7	Groundnuts, Rice, etc.	Subject to cargo	2 closed shed, 9,450m^2
	5	51-52	160	12	No.51: for fishing boat No.52: Phosphate(Taiba)	1,000 tons/hour	Stoking area of 70,000 tons
	6	61-62	331	7.9-8.6	Loading Groundnuts Oil Discharging Wine	Subject to cargo	4 pipelines for Gound- (Tank Capacity 5,385m^3)
	7	-	-	-	-	-	Under Planning
	8	81-86	865	10	Bunkering, Discharge of Logs, Scrap, etc.	Subject to cargo	
	9	91-94	503	11m	Bunkering, Unloading Oil		
	Nort Jetly	01-02	200	9.6-10	"		

Table III-7-2 Port Agents in Dakar

Type of Business	No. of Enterprises	Name of Trade Association
Ship's Agency	15	West African Shipping Association (SAMCOA)
Forwarding	18	West African Transport & Forwarding Agent's Association (SETTAO)
Stevedoring	18	West African Ports Stevedoring Association (SEMPAO)
Bunkering	6	
Insurance	28	
Ship Chandlery	15	
Ship's Repairs	1	

Fig. III-7-1 Main Ports and Routes of Inland Transportation in Senegal



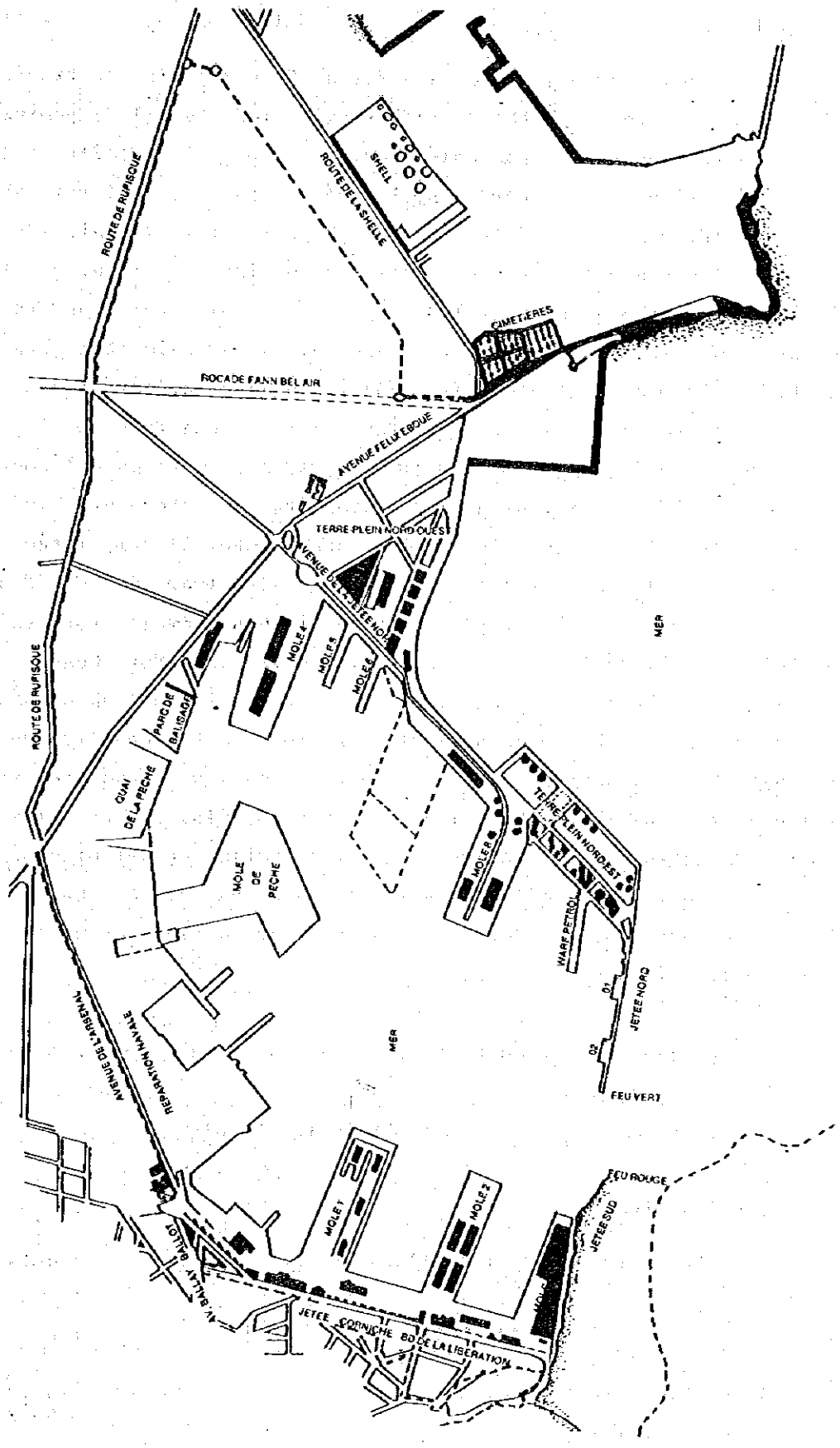


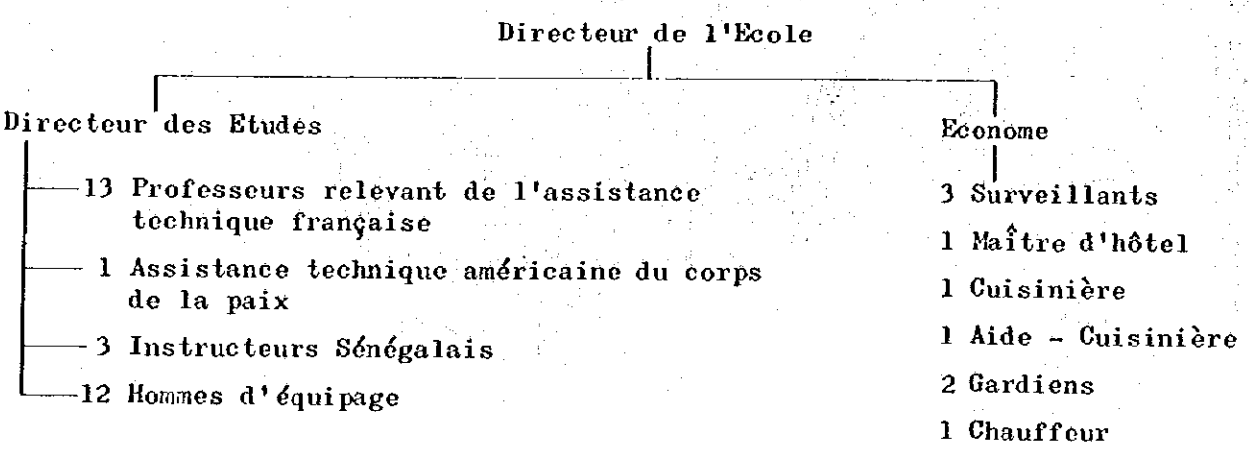
Fig. III-7-2 Sketch of the Port of Dakar

8. Situation of Seafarers

In Senegal, the biggest demand for seafarers is in the fishing industry. Other demand sources are the coastal service and the oil companies which hire seafarers as supervisors for unloading cargo oil. The Seafarers Training Center and National Seafarers School were combined in 1971 into the National Seafarers Training School, located in Dakar, to train technical experts. This school has a crew training class and an officers training class. In fiscal 1980, there were about 1,300 applicants which were more than 30 times the planned enrolment of 40. From this, it can be said that this school has outstandingly excellent students. The training of officers is making smooth progress regardless of severe selective examinations in each stage of training. This is because there are places of work, such as foreign oil companies, where the wage level is fairly high. Regarding crew, as there are many fishing boats in Senegal, it can be said that their number is very large.

This school cannot train high rank officers (captain, chief officer or chief engineer of long cruise). Instead, it has a system for sending trainees to study and obtain licences in France, Nigeria and Ivory Coast. At present, it seems that the training of high rank officers is not making smooth progress partly because there are no suitable positions in the country even though trainees obtain licenses. However, four trainees who graduated from the officers class of this school last year are studying at present in Ivory Coast. As there are future prospects of a similar number of candidates, Sengal will have chief officers after three years. It can be said that subsequent success in producing high rank officers depends on whether the nation will supply suitable places of work for them.

Fig. III-8-1 Organization of Ecole Nationale de Formation Maritime



PART IV SITUATION OF SHIPBUILDING INDUSTRY

1. Present Situation of Shipbuilding Industry in Senegal

There are presently several shipyards around the main ports in Senegal. These shipyards have been engaged in building and reparing such small ships as wooden ships, barges, etc., but do not have a capacity of constructing large steel ships. The Dakar Marine is the only company which can cope with repairing large sized steel vessels.

One of the important policies of the Senegalese Government is to foster their own shipbuilding industry, and the government has put every shipyards under the control of Ministry of Equipment. Aiming at acquiring foreign currency by repairing foreign ships, the government has been putting emphasis on rearing the Dakar Marine in particular, and pushing forward expanding of their equipment and improving of the repairing capacity as an independent project even in the fifth 4 year-plan which is now under way.

2. Dakar Marine

2-1 General

Port of Dakar is of importance as a bunkering port for the Atlantic sea lane. In addition to the purpose of strengthening capabilities of the bunkering port, the Senegalese Government planned to build floating dock capable of repairing large vessel upto 60,000 DW, established the Dakar Marine in 1973 by cooperation of European countries - France, the United Kingdom, West Germany.

Presently, the Dakar Marine has been engaged in reparing the ships for the Navies of Senegal, France, foreign fishing and merchant fleets, as well as building and repairing coasters. Repairing work for French Navy accounts for a big proportion in their actual business and the two are closely connected.

COSENAM, responsible for the operation of this project, is planning to have the Dakar Marine make the classification survey.

2-2 Organization

The organization is shown in Fig. IV-2-1.

The Dakar Marine consists of 2 rooms, 7 departments and 8 shops, with 440 employes including 30 managers and engineers.

Planning & Coordination Office, one of the most important organizations, is in charge of management, making a long-term work program, and coordinating

activities among the departments, and negotiates with Navies of Senegal, France.

In the category of repair, Hull Department, Machines Department and Electricity & Electronics Department are engaging hull repair and maintenance of various machines, electric and electronics equipment.

As for training the employes, they have Training Center Department whose primary purpose is to bring up Senegalese shipbuilding engineers, but the Training Center has been extensively accepting trainees from French-speaking African countries. There are two courses - general workers course and skilled workers course of which the duration is one year and two years respectively. About 30 trainees finish their courses annually.

2-3 Installations

Table IV-2-1 gives the facilities at major shops

No. 1 dock (dry) was handed over by DCAN (Department de Construction et Architecture, Navy) of the French Government. The dock, with overall length 190 meters, is capable of docking two ships simultaneously, dividing it into two sections, 120 meters and 70 meters long respectively, by means of a gate. A track-mounted 40-ton crane attached can be operated along the entire dock.

No. 2 dock (floating) with a docking capacity of approximately 60,000 DWT, was constructed in Norway, and delivered in June 1980 to the Dakar Marine which would commence its operation at the end of this year. The new shops attached to the dock will be completed at the same time.

A repair quay has been used for repairing shell plates above a draft line, decks and various fittings.

The machinery shop is capable of overhauling engines up to approximately 5,000 ps.

It is estimated that, as of today, they can repair a ship up to 15,000 DWT including the classification survey. The repair capability will greatly increase at the time when No. 2 floating dock and its shop will commence to operate at the end of 1980.

2-4 Work Performed

They have built coasters less than 1,000 GT so far, but do not have a plan to construct ships larger than the above. They have repaired about 180 ships annually which consist of patrol boats, coastal escort vessels, coastal surveillance vessels of the Navies of Senegal, France as well as foreign fishing and merchant fleets. The majority of works for large ships are of an emergency type of repair.

Fig. IV-2-1 Organization of Dakar Marine

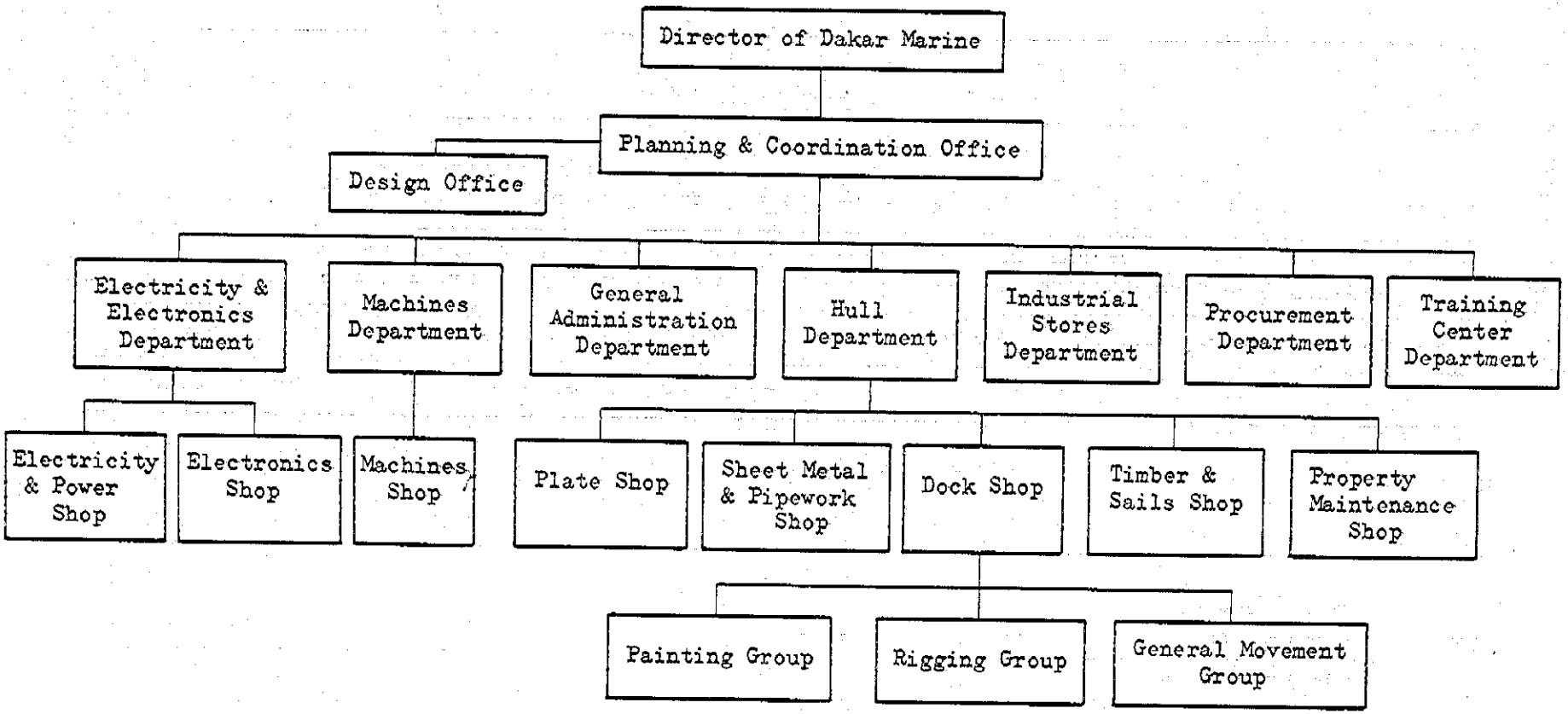


Table IV-2-1 DAKAR MARINE: Installations for Ship Construction & Repair

Dock and Repair Quay

Item	L x B x D (m)	Capacity (Dead Weight Tons)	Attached Facilities
No. 1 Dry Dock	189 x 23 x 8.8	Approximately 25,000	. Track-mounted crane -40 tons . Compressed air supply . Fresh & sea water supply
No. 2 Floating Dock		Approximately 60,000	. Track-mounted crane -60 tons . Compressed air supply . Fresh & sea water supply
Repair Quay	150 x - x 5	-	. 2 cranes -15 tons & 5 tons each . Compressed air supply . Fresh & sea water supply

Shop

Name	Work to Perform	Main Equipment
Plate Shop	Process of metal & steel plates	Guillotine shears, Presses, Gas cutters
Machines Shop	Repair & survey of main engines, various pumps, hydraulic equipment, etc.	Lathes, Drilling machines, Grinders Milling machine
Electricity & Power Shop	Installation & repair of ship's electrical systems, and electricity supply	Electric equipment, 2 generators with capacity of 1,100 KVA
Electronics Shop	Installation & repair of marine electronics systems	Detectors

PART V EXAMINATION OF THE FLEET EXPANSION PROGRAM

1. Purpose of Fleet Expansion Program and System for its Implementation

The purpose of the program and the gist of the system for implementing it is as follows:

1-1 Purpose of Fleet Expansion Program

The purpose of this program is

(a) to improve the international balance of payments which is the anchor of national economic policy;

(b) to develop a national line; and

(c) to create employment opportunities for marine engineers and to enhance marine engineering capability.

The program, moreover, is given a very high priority ranking in national policy. It is also the consensus of the Senegalese concerned to push this program vigorously as a national project.

As already pointed out, Senegal is suffering from a chronic shortage of foreign exchange. Furthermore, other West African countries are making progress in building their national lines. Among Senegalese seamen, there is little incentive to acquire the high-level technology, knowledge and experience necessary for officers of captain class because the country does not possess its own ships. In view of the above, it can be said that the implementation of this program is of great significance for Senegal.

1-2 System for Implementation of this Program

Senegal's system for implementing this program as a national project is as follows:

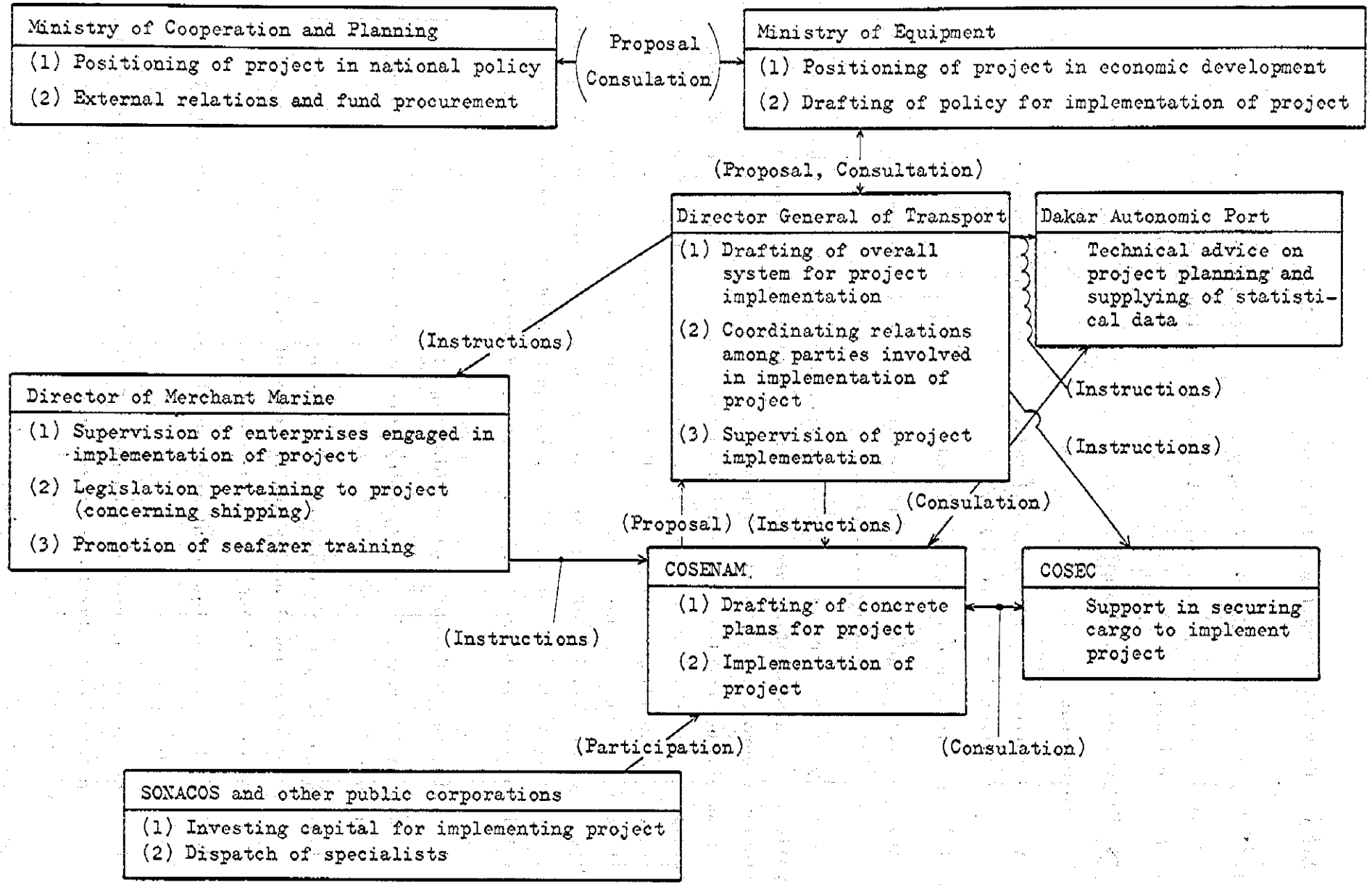
(a) The Ministry of Cooperation and Planning determines the priority in terms of national policy and in terms of overall economic and social policies, including the fiscal aspects.

(b) The Ministry of Equipment draws up the policy for concrete implementation.

(c) The Director General of Transport of the Ministry of Equipment draws up the implementation organization and acts as coordinator between implementing organs.

(d) COSENAM draws up the implementation program and manages it.

Fig. V-1-1 Domestic Implementation System of Fleet Expansion Program



1-3 Outline of COSENAM

The outline of COSENAM which is the principal body for implementing this program is as follows:

(1) Name: Compagnie Senegalaise de Navigation Maritime, abbreviated as COSENAM

(2) History: COSENAM was established on October 13, 1979 as a semi-governmental joint-stock company. At present it is making preparations to start business activities.

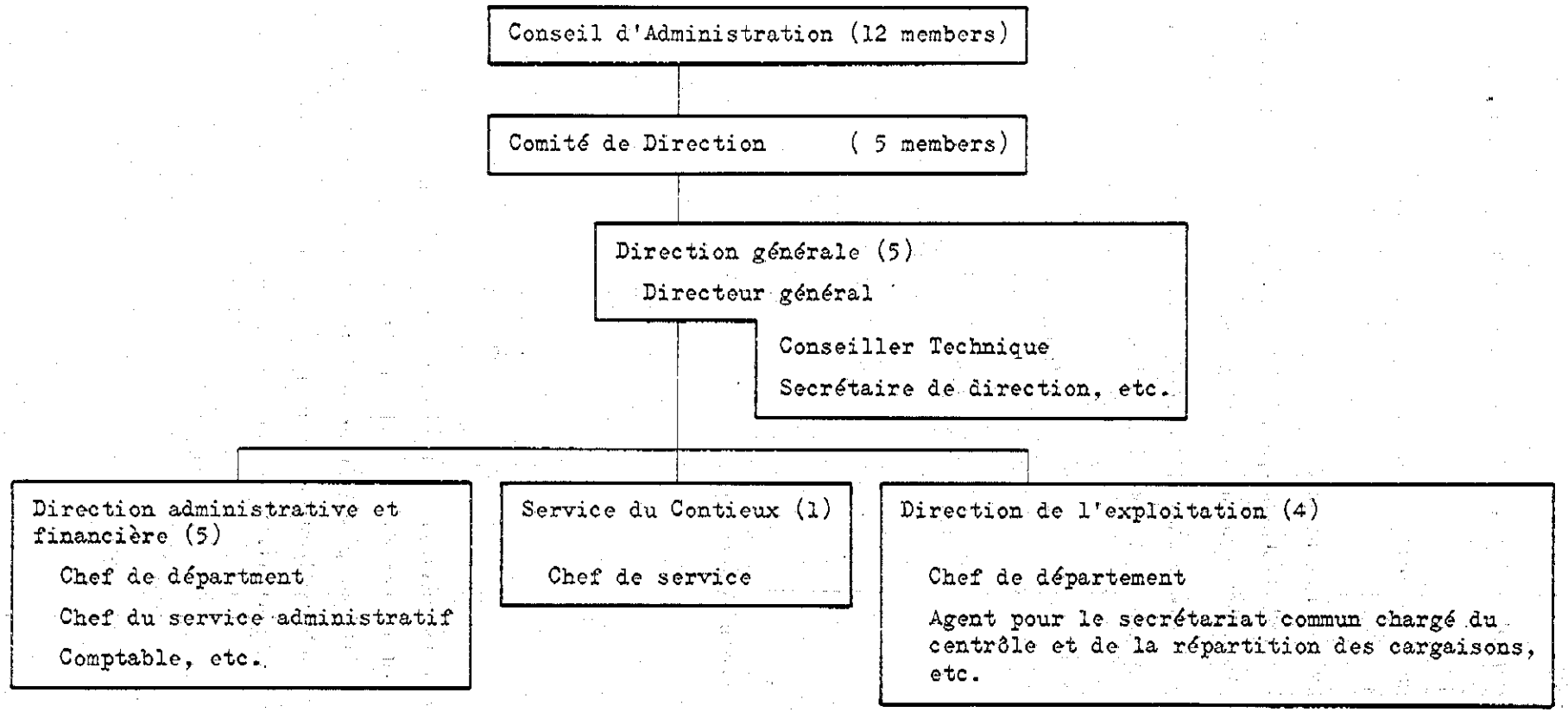
(3) Capitalization: 100,000 shares totaling 1,000 million CFAF, with one share valued at 10,000 CFAF. (50% paid-in).

(4) Shareholders

	Thousand units	
SONACOS	20	20%
ONCAD	15	15%
P.A.D.	15	15%
COSEC	7	7%
BNDS	5	5%
CSPT	5	5%
CPSP	5	5%
(Public corporations sub-total)	(72)	(72%)
Senegalese citizens	12	12%
SNCDV	8	8%
DAL	3	3%
CMB	3	3%
Nedlloyd	2	2%

The board of directors consist of 12 members mainly representing stockholders. Under the board is the Management Committee consisting of five persons knowledgeable in shipping and finance. The Management Committee is engaged in actual work such as drawing up business plans and studying type of ships to be built. The organization of the company at the present stage is shown in Fig. V-1-2.

Fig. V-1-2 Organization of COSENAM



2. Ship Specifications

2-1 Outline of Ship Specifications Planned by Senegalese Side

The outline of ship specifications presented by Senegalese side is as follows:

2-1-1 Type of Ship

The vessel to be constructed as a multiple purpose cargo ship for transporting general cargoes, container cargoes and such bulk cargoes as phosphate and grain.

326 20 ft containers to be stowed in cargo holds and on upper deck.

The vessel to be equipped with a diesel engine and driven by a controllable pitch propeller through a reduction gear.

The vessel to have a tween deck, forecastle deck and poop deck, and the bow and stern to be of bulbous type.

2-1-2 General Arrangement

Cargo space to be divided into 3 subdivisions of which No.2 and No.3 cargo hold to have a tween deck.

Engine room and bridge to be located aft, and double bottom under the holds to be used as fuel tank and ballast tank.

25 single rooms for complement, one double room for 2 cadets and one single room for a shipowner to be arranged on bridge as accommodation, and a dispensary, mess rooms, pantries, saloons, an office, stores, a galley, public lavatories as common space.

2-1-3 Principal Dimensions

Length o.a.	130.00m
Length p.p.	120.00m
Breadth (mld)	19.20m
Depth (mld)	10.60m
Depth of Tween Deck	6.60m
Load Draft	8.00m
Dead Weight	9,000t

Capacity	
Fuel Oil	680t
Gas Oil	80t
Diesel Oil	40t
Fresh Water	200t
Ballast Water	1,700t
Container	326 (114 20 ft containers on deck and 212 in cargo holds)
Grain	13,300m^3
Bale	12,000m^3
Service Speed	15.3 kt (6,400 D/W, 80% MCR, 15% SM)
Classification	BV-I 3/3

2-1-4 Construction

The vessel to be of all-welding construction, with a combined system of both longitudinal framing for double bottom and transverse framing for the other hull. Upper deck to be of longitudinal system except around hatchways, and the hatchway portions to withstand the load of 2 tiers of a 15-ton container. Tween deck excluding hatchway portions to be of transverse system to withstand the load of 2.8 tons/m^2, and water ballast tanktop the load of 4 tiers of 20 ft containers or 8 ton/m^2.

Two-row hatchways to be provided for No. 2 and No. 3 cargo hold, and a longitudinal bulkhead for tween deck.

2-1-5 Cargo Gear

5 speed cranes (30 tons) to be installed. Hatch cover for upper deck is as follows:

No.1 : 12.5 m x 8 m (End folding type, watertight) x 1

No.2 & No.3: 25.5 m x 8 m (End folding type, watertight) x 4

Hatch cover of No.2 & No.3 for tween deck has the same size with that for upper deck. (End folding type, non-watertight)

2-1-6 Main Engine and Shafting

Main engine to be a set of diesel engine, Sulzer, type AESA-4RLA 56, and MCR to be 5360 ps, 170 rpm.

Revolution of main engine to be reduced half by a reduction gear and connected to a propelling shafting through elastic coupling. The shafting

to consist of a screw shaft, an intermediate shaft and a controllable pitch propeller.

Various equipment associated with the main engine, a starting compressor and so on to be equipped.

2-1-7 Generator and Boiler

One 350 kw AC generator (driven by the main engine) and three 300 kw AC generators (425 ps engines), 380 v x 50 Hz to be installed, as well as a heavy-oil burning boiler, an exhaust gas economizer and a distilling plant (10 ton/day).

2-1-8 Others

An independent fire pump, a CO_2 fire extinguishing system, an oil separator and an air conditioner, etc. to be installed, and the vessel to be equipped with a remote control for main engine, an automatic control for various auxiliaries, an automatic steering arrangement, etc., with a high grade.

2-2 Technical Consideration to Ship Specifications

(1) Principal Dimensions

Lpp	:	120.00m
B	:	19.20m
D1	:	10.60m
D2	:	6.60m
d	:	8.00m

From the above,

CN = L x B x D1 = 24422

SN = L (B + D1) = 3576

(2) Estimate of Δ_L (Light Weight)

As a result of rough calculation,

W_H (Hull Weight)	=	2,700 tons
W_P (Fitting Weight)	=	850 tons
W_M (Machinery & Electric Fitting Weight)	=	320 tons
Water, Oil in Engine Room	=	60 tons
		3,930 tons

Say Δ_L = 3,950 tons

(3) Estimate of ⊠G and KG

As a result of rough calculation,

⊠G = 8.40 KG = 8.48

(4) Estimate of Displacement and C_B

1) Under full load condition:

$\Delta_F = \Delta_L + DW = 12,950$ tons

$C_B = \Delta_L/L \times B \times D1 \times 1.025 = 0.6854$

2) Under 6,400 DW condition:

$\Delta_F' = \Delta_L + DW = 10,350$ tons

From rough calculation:

d' = 6.60 m

Then, $C'_B = \Delta_F'/L \times B \times d' \times 1.025 = 0.664$

(5) Estimate of GT

From rough calculation:

V_u (Under Deck Tonnage Capacity) = 16,031 m^3

Va (Above Deck Tonnage Capacity) = 2,906 m^3

V (Total Tonnage Capacity) = 18,937 m^3

GT = 18,937/2.832 = 6,700 tons

(6) Estimate of Capacity

From rough calculation:

V_G (Grain) = 14,000 m^3

V_B (Bale) = 13,000 m^3

(7) Estimate of Speed

As Main Engine's MCR = 5,360 ps

Revolution (N) = 170/2 rpm

Therefore,

Normal Output (NOP) = 5,360 x 0.8 x 0.98

Where;

Say 80% MCR

Efficiency of Reduction Gear: 98 %

Revolution Mergin : 2 %

Then, N' (Revolution at NOP) = 78.9 x 1.02 = 80.5 rpm

Speed curves obtained from the above are shown in Fig. V-2-1 and 2.

From Fig. V-2-1, we can get

V_S = 13.75 kt under full load condition

From Fig. V-2-2,

V_S = 14.85 kt under 6,400 DW condition

The speed of 14.85 kt is slower than 15.3 kt given in the specifications

MCR necessary to get 15.3 kt is;

From the Figure,

4,850/0.8 x 0.98 = 6,186 ps

When 85% MCR is adopted, the speed becomes 15 kt, and then MCR required for 15.3 kit is;

4,850/0.85 x 0.98 = 5,822 ps

(8) General Arrangement and Container Stowage

General arrangement and container stowage plan based on the specifications and the above examinations are shown in Fig. V-2-3 and 4.

1) Number of stowable containers

Containers of 3 rows & 3 tiers are to be stowed in No.1 cargo hold, and 6 rows & 4 tiers in No.2 and No.3 cargo hold.

Stowable number decreases around fore part of No.1 and No.2 hold and aft part of No.3 hold due to the hull shape.

On deck, 3 rows & 1 tier is to be employed on No.1 hatchway.

It is worth examining 5 rows & 2 tiers on No.1 hatchway in order to increase the number, but this may cause cargoes to crumble by wave and worsen a fore visibility. On No.2 and No.3 hatchway, 6 rows & 2 tiers is best suited, compared with 7 rows & 2 tiers which may make deck sides narrower. Total number of stowable containers aggregates 296.

Number in parentheses in the figures shows containers in number for 7 rows. All containers examined above are of 20 ft container.

2) Bulwark

Handrail system is to be employed instead of bulwark, because a deck side gets narrow and impedes passing when containers are stowed on the upper deck.

3) Diameter of Propeller

In calculation, the best suited propeller diameter is 6.05 meters, but it is desirable to make it a little smaller, taking the draft in light condition into consideration.

4) Trim and stability calculation

Several examples of loading conditions are roughly estimated and listed in Appendix 1.

As is shown in condition D, G_0M becomes negative resulting in a dangerous loading condition. It is required that stability calculation under more various conditions should be made, a loading manual also be compiled so that much attention can be paid to an actual loading.

As examined above the basic matters of the ship specifications planned by the Senegalese side, we found and analyzed some problems such as stability, speed, number of stowable containers and so on.

2-3 Tentative Modified Specifications

Price of the ship based on specifications planned by Senegalese side (hereinafter called plan A) is estimated to be 2,950 million yen per ship, when delivered in the middle of 1982.

As a result of financial evaluation based on the above price, it was found that a high internal rate of return was unobtainable. Thence, the survey team made tentatively the following modified specifications (hereinafter called plan B) taking into consideration both economical efficiency and technical aspects.

Price of the ship based on plan B was estimated to be 2,700 million yen under the same condition with plan A.

General arrangement and container stowage plan for plan B are shown in Fig. V-2-5 and 6.

Comparison between plan A and plan B is listed in Table V-2-1.

Major modified items are as follows:

(1) Cargo Hatch

Two-row hatch is to be changed to single-row hatch of which the dimensions are shown below;

No. 1	:	12.5 m x 8 m
No. 2	:	25.5 m x 13 m
No. 3	:	25.5 m x 13 m

Shifting boards are to be installed on tween deck in place of a longitudinal bulkhead, and hoppers to be arranged on deck side.

Table V-2-1 Comparison Plan "A" with Plan "B"

	Plan A	Plan B	Remarks
DW (T)	9,000	9,000	
Grain Capacity (M^3)	12,000 (13,000)	14,000	( ): Calculated by the survey team
Bale Capacity (M^3)	13,300 (14,000)	13,000	
Container (No.)	326(298)	256	20-ft container
GT (T)	6,700	6,700	
Service Speed (Kt)	15.3(14.85)	14.85	80% MCR, 15% SM at 6,400DW
L_{oA} (M)	130.00	130.00	
Lpp (M)	120.00	120.00	
B (mld) (M)	19.20	19.20	
D (mld) (M)	10.60	10.60	
d (mld) (M)	8.00	8.00	
M. Engine MCR (ps)	5,360	5,200	
M. Engine SCO (ps)	4,290 *1	4,290 *2	*1:80% MCR, *2:82.5% MCR
Crane Capacity (T)	30	25	
Propeller	CPP	FPP	
Cargo Hatch (row)	2	1	
Ship Price (billion yen)	2.95	2.70	

(2) Capacity, etc.

Dead weight and cargo capacity remain unchanged, but the total number of stowable containers is to be 256 with 5-row stowage. Since the deck side gets wider, bulwark is to be installed instead of hand rail.

(3) Crane

5 cranes with capacity of 25 tons each are to be installed. No trouble can be expected with handling of 20 ft container.

(4) Main Engine

Another type, more economical type of engine, with less fuel consuming and less expensive is to be employed in place of type 4RLA56, without change of MCR.

(5) Propeller

A fixed pitch propeller is to be provided from the viewpoint of mainte-

nance and economical efficiency. Therefore, generator driven by the main engine is to be of an independent one.

(6) Trim and Stability Calculation

Rough calculations under the three loading conditions are listed in Appendix 2.

As shown in condition G, a larger G_oM and better stability can be expected in comparison with plan A.

2-4 Estimation of Ship Price

Item	Plan "A" (million YEN)	Plan "B" (million YEN)
Construction cost (includes cost of spares)	5,800	5,300
Contingencies (about 2%)	100	100
Total	5,900	5,400

(1) Price : total amount for two ships

(2) Delivery : in the middle of 1982

(3) Construction term : about ten months after begin work

Fig. V-2-1 BHP, EHP - V Curve
(9,000 D W)

d = 8.00 m

C_B = 0.6854

Dp = 6.05 m

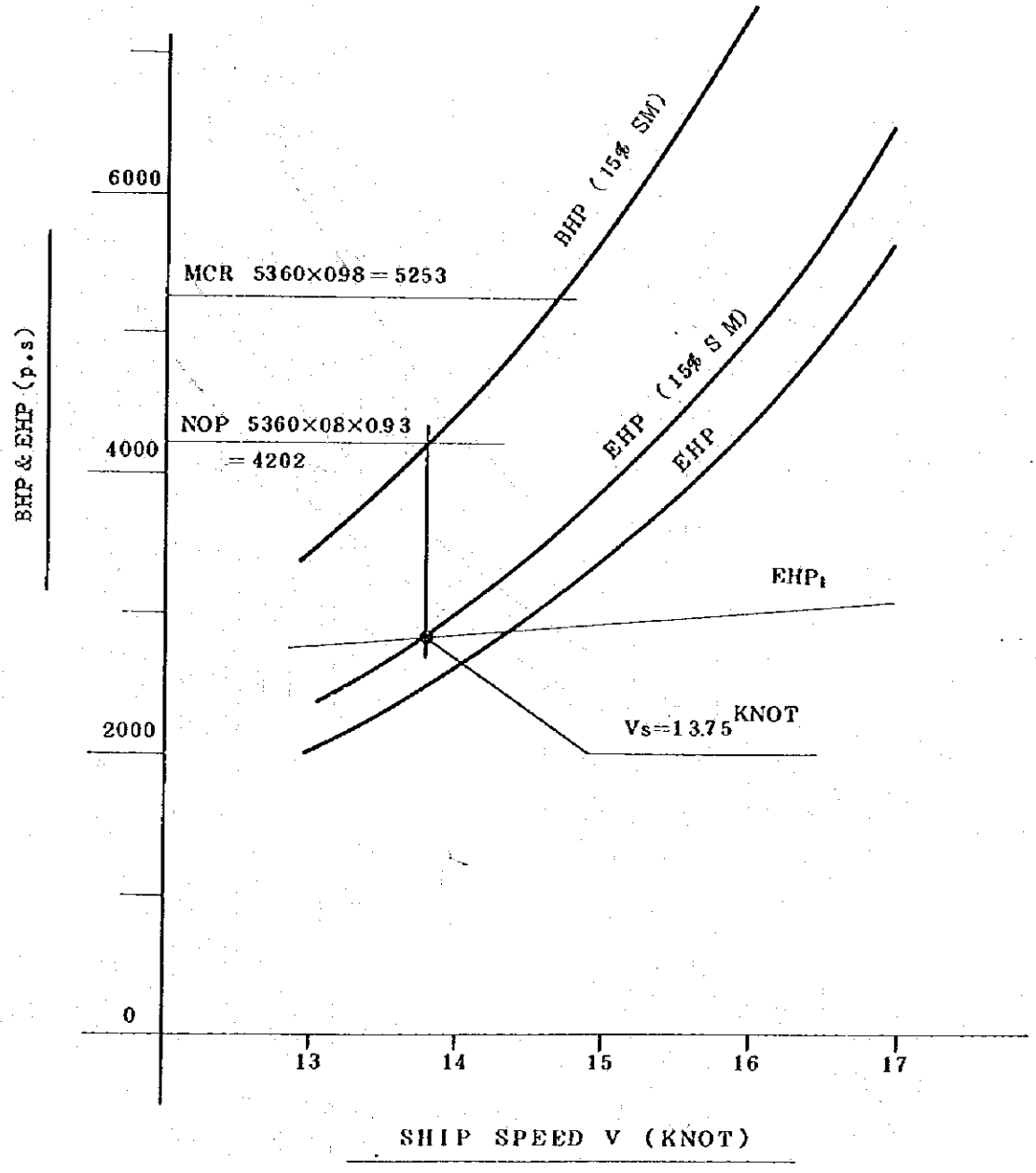


Fig. V-2-2 BHP, EHP - V Curve
(6,400 DW)

d = 6.60 m
C_B = 0.664
Dp = 6.05 m

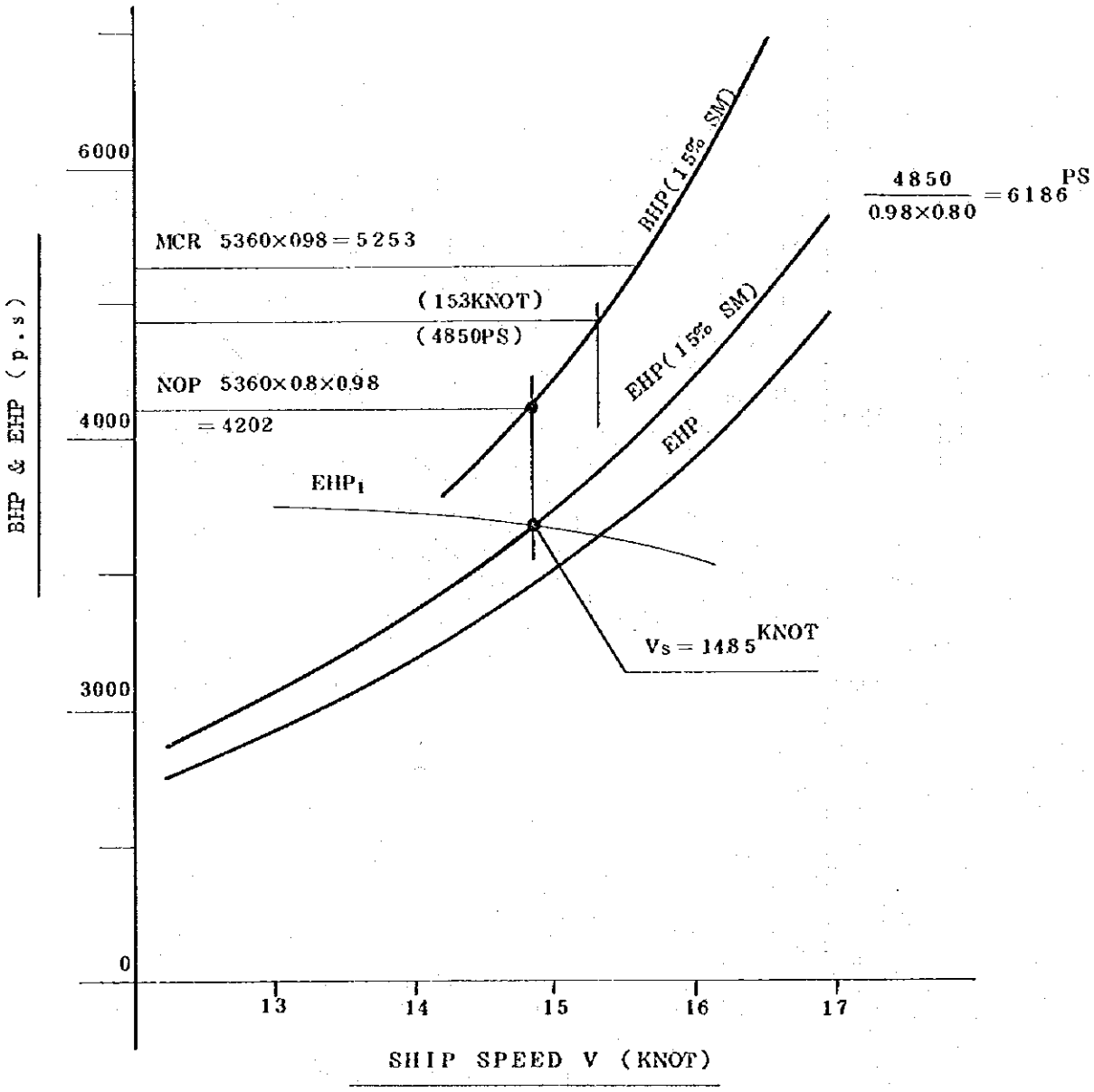
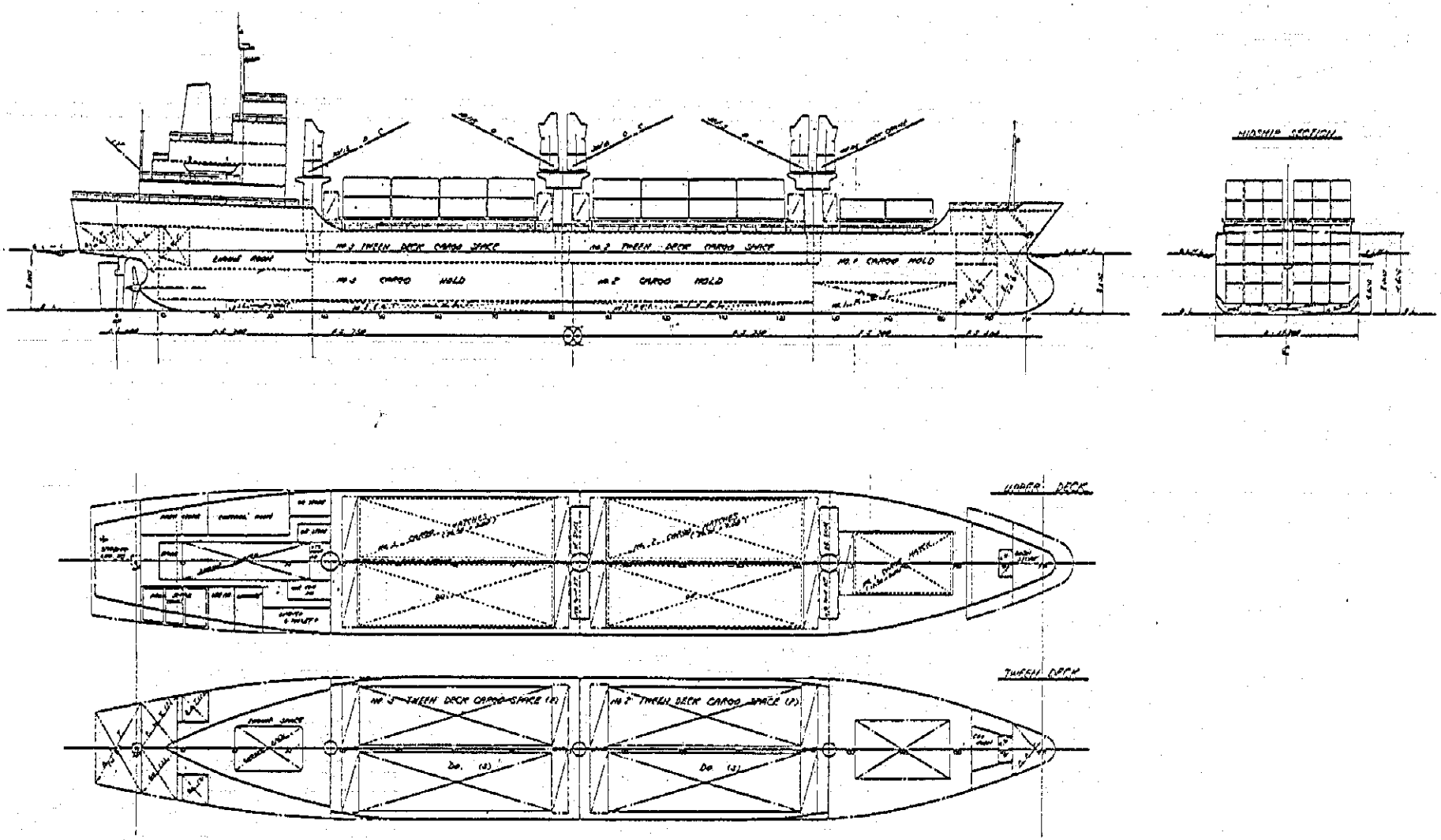


Fig. V-2-3 General Arrangement (Plan "A")



NUMBERS OF CONTAINER

	IN HOLD	ON DECK	TOTAL
NO.1 CARGO HOLD	14	6	20
NO.2 CARGO HOLD	90	48(44)	138(144)
NO.3 CARGO HOLD	90	48(46)	138(146)
TOTAL	194	102(118)	296(312)

20' CONTAINER L × B × H 20' × 8' × 8'6"
6.058 × 2.249 × 2.591

Fig. V-2-4 Container Stowage Plan (Plan "A")

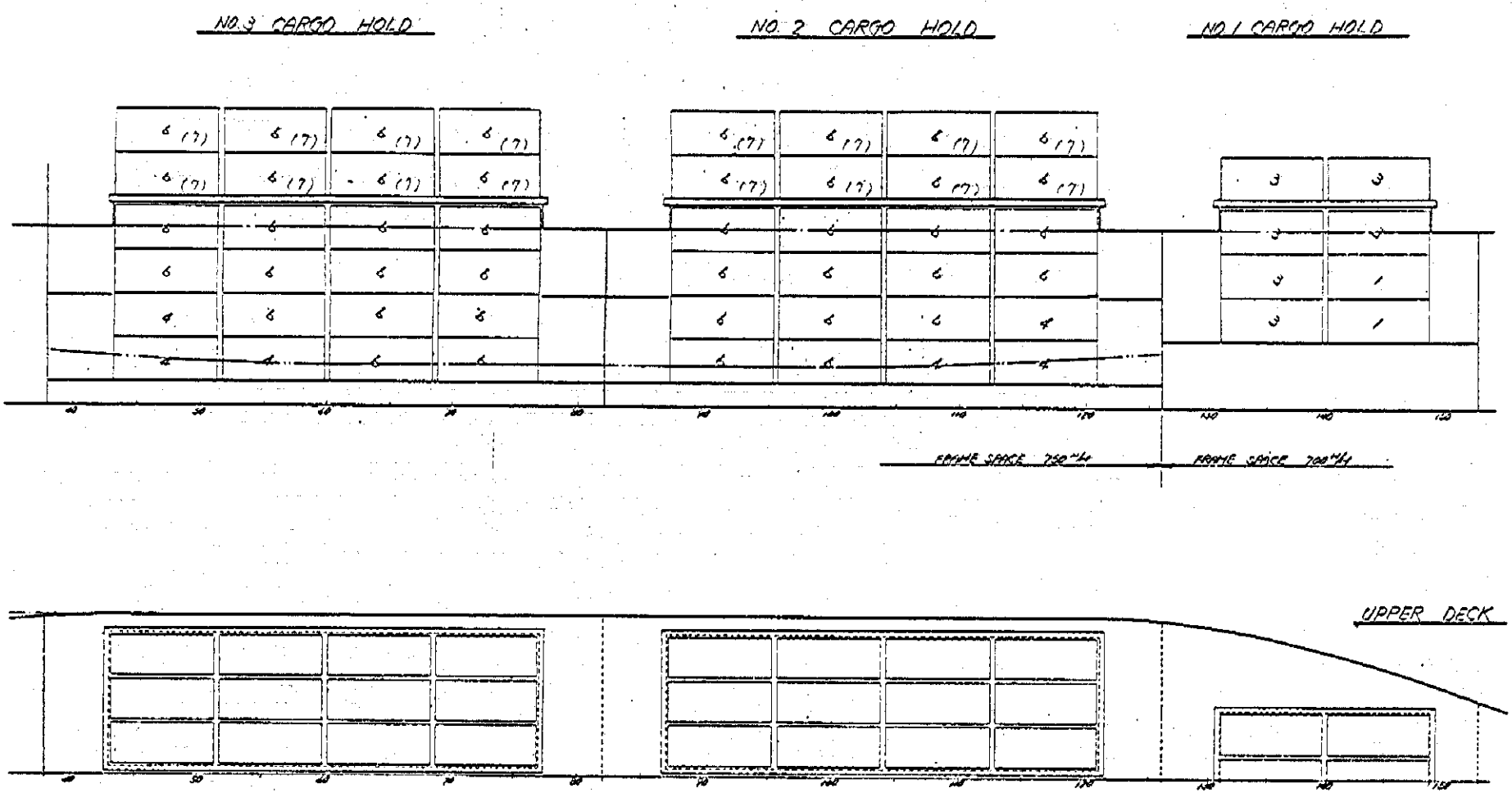
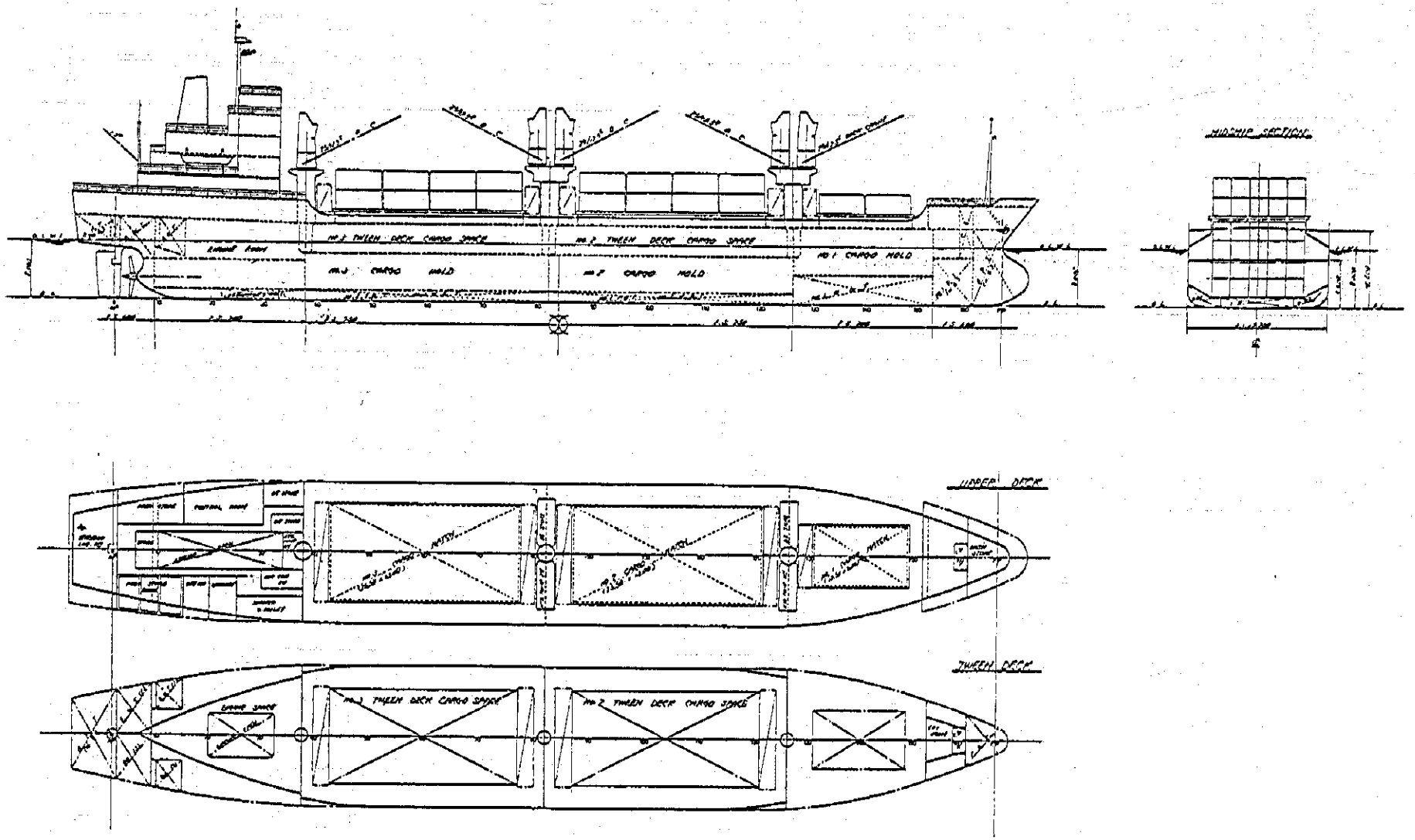


Fig. V-2-5 General Arrangement (Plan "B")

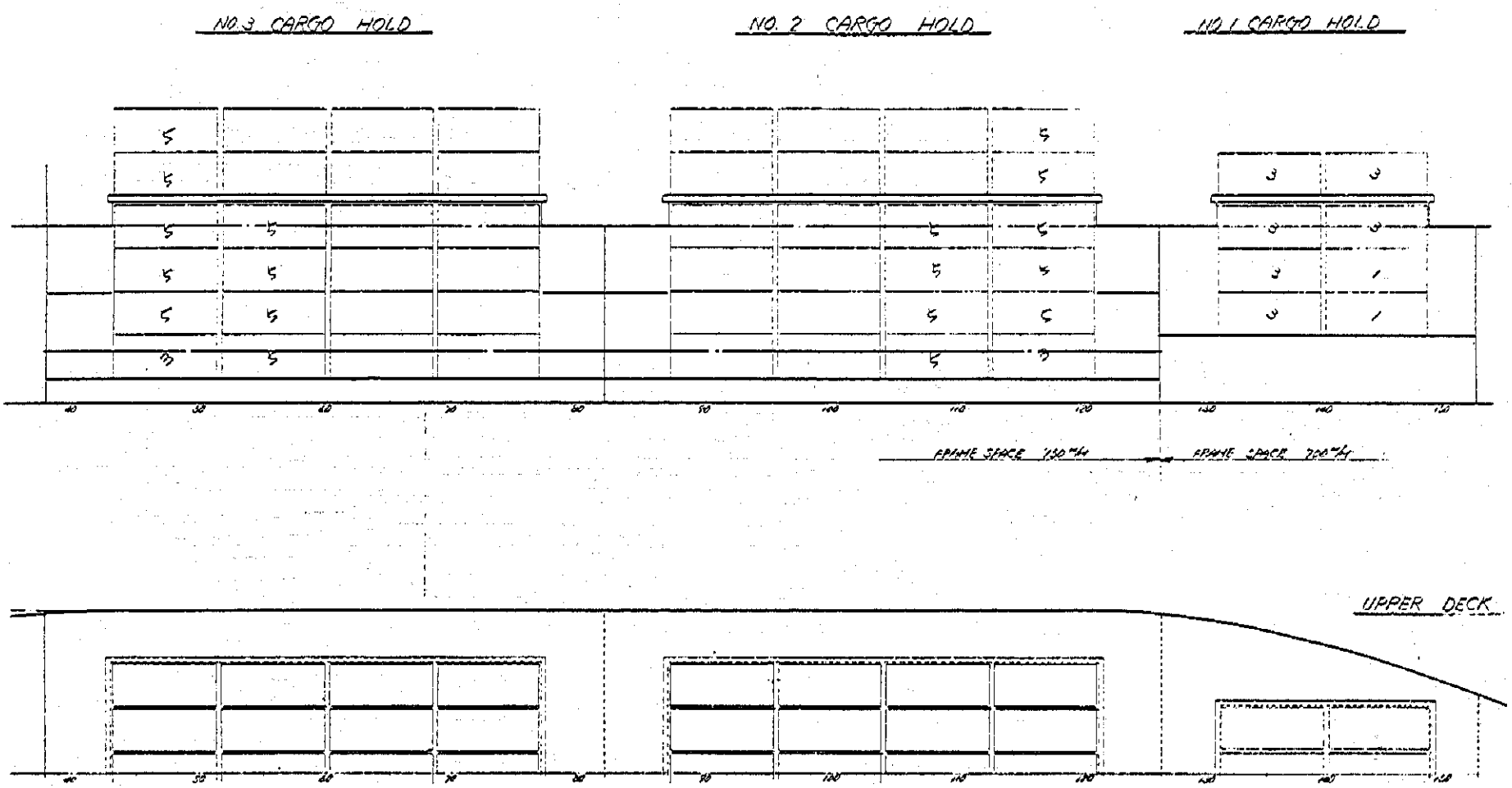


NUMBERS OF CONTAINER

	IN HOLD	ON DECK	TOTAL
NO.1 CARGO HOLD	4	6	20
NO.2 CARGO HOLD	78	40	118
NO.3 CARGO HOLD	78	40	119
TOTAL	170	86	256

20' CONTAINER L × B × H = 20' × 8' × 8'6"
1 CON = 2259 / 2291

Fig. V-2-6 Container Stowage Plan (Plan "B")



3. Operation Plan with Voyage Account

3-1 COSENAM's Operation Plan with Voyage Account

(1) COSENAM's operation plan is as follows:

a) To assign two multi-purpose cargo vessels of 9,000 D/W tons to the Dakar-Antwerp/Bordeaux Range-Dakar shuttle service

b) To make a round trip in 40 days

c) To maintain regular sailings at 20-day intervals

d) To make annually 18 voyages (9 voyages x 2 vessels)

(2) In its estimate of freightage and cargo, COSENAM expects for the southbound voyage to load mainly steel materials at Antwerp and Dunkerque and general cargo and machinery at Le Havre and Bordeaux. The estimate of freightage and cargo is as follows:

Antwerp	700 F/T x 12,500 CFAF =	8,750,000 CFAF
Dunkerque	1,100 F/T x 11,500 CFAF =	12,650,000 CFAF
Rouen	800 F/T x 35,000 CFAF =	28,000,000 CFAF
Le Havre	800 F/T x 25,000 CFAF =	20,000,000 CFAF
Bordeaux	300 F/T x 50,000 CFAF =	15,000,000 CFAF
Total	3,700 F/T (including containerized 20' x 30)	84,400,000 CFAF

The freight rates estimated for the cargoes loading at Rouen, Le Havre and Bordeaux seem to be considerably high.

The northbound estimates are:

Phosphate:	8,000 F/T x 4,000 CFAF =	32,000,000 CFAF
General cargo:	600 F/T x 15,000 CFAF =	9,000,000 CFAF
Total:	8,600 F/T	41,000,000 CFAF

The freight rate for general cargo is appropriate. The freight rate for phosphate fluctuates with the market. Therefore, it would be more expedient to take the long-term, high, stable rate.

The total annual loading tonnage for 18 voyages is:

Southbound: 3,700 x 18 = 66,600 F/T (33% of total cargo flow)

Northbound: Phosphate: 144,000 F/T (40-50% of cargo bound for France)

General Cargo: 10,800 F/T (46% of northbound cargo)

In view of the cargo flow at present, these figures would mean that COSENAM intends to get a considerably large share of the cargo flow. In order to obtain these figures, national support will be necessary.

(3) Assuming the speed of the vessels to be 15.3 knots, COSENAM sets the number of days per voyage as follows:

Port	Distance (nautical miles)	Days in port
Antwerp		2
	90	
Dunkerque		2
	145	
Rouen		1.5
	70	
Le Havre		1.5
	614	
Bordeaux		1
	2,260	
Dakar		6
	2,260	
Bordeaux		3
	614	
Le Havre		2
	230	
Antwerp		3
	6,283	
No. of days	18 days	22 days

The number of days at sea is 18 and in port is 22, making a total of 40 days. If the speed, calculating from the ship size and engine power (see vessel design referred to above), is set at

14.85 knots in the case of 6,400 D/W

13.75 knots in the case of 9,000 D/W

it will be necessary to revise the schedule to 19 days (18 days + 1 day of margin) at sea and 21 days in port, totalling 40 days.

Considering the loading tonnage and stevedoring efficiency, the 21 days in port allow for some leeway.

(4) The per voyage cost as calculated by COSENAM is as follows:

1)	Cargo expenses		
	Southbound	3,700 F/T	25,970,000 CFAF
	Northbound	8,600 F/T	4,500,000 CFAF
	Sub-total		30,470,000 CFAF
2)	Bunker		
	354 K/T x 45,000 CFAF	=	15,930,000 CFAF
3)	Port charges	eight ports	4,000,000 CFAF
4)	Agency commission		5,974,000 CFAF
5)	Claim		3,581,000 CFAF
6)	General administrative costs 7.5% on total freight		9,405,000 CFAF
	Total		69,360,000 CFAF

The cargo expense is appropriate, but it seems that the container rental cost of roughly 1,800,000 CFAF is missing from the calculation.

Regarding bunker cost, the fuel consumption and bunker price are somewhat on the high side.

The port expense is considerably underestimated. Claim money is more or less appropriate.

Before assessing the general administration cost and agency commission, an explanation of the division of work between COSENAM and agency is necessary. The division of work is as follows:

Ship's managment by COSENAM

Marketing and line operation by agency.

In the liner trade between West Africa and France, the French shipping company SNCDV (or its affiliates CMCR or DELMAS) acts as the agency in France for the national lines of West Africa, including SITRAM. The West African national lines (or their agents in their own country) act as the agency for SNCDV in their respective countries. Through this mutual cooperation, they are trying to expand the cargo flow share of their own country's vessels and of the partner country. COSENAM, too, will adopt the same agency system with SNCDV.

In Belgium, the Belgian Shipping Company C.M.B., which has invested capital in COSENAM, is scheduled to become COSENAM's agent.

Taking the above into account, it is believed that the following agency commission per voyage is appropriate:

Southbound:	6% of freightage	5,064,000 CFAF
Northbound:	phosphate 2%	640,000 CFAF
	general cargo 3%	270,000 CFAF
	Total	5,974,000 CFAF

The projected 7.5% for general administrative cost appears to be very high when it is considered that marketing and line operation are to be entrusted completely to the agent. It is necessary to pay full attention to the fact that COSENAM would be able through its corporate efforts to bring down the general administrative cost and the ship expenses.

(5) As seen from the above, there are problems concerning specific areas. However, COSENAM's estimate of the financial balance per voyage is as follows:

Income	125,400,000 CFAF
Expenses	69,360,000 CFAF
Net	56,040,000 CFAF

This works out to on unpractically high earnings of 1,401,000 CFAF (US$6,834 at $1 = 205 CFAF) per day.

(6) COSENAM calculates the expenses per day, excluding capital costs such as interest and principal repayment, as follows:

Crew cost	400,000 CFAF
Repairs	200,000 CFAF (Including classification)
Insurance	40,000 CFAF
Total	640,000 CFAF

For the ship management cost of a developing country, this is a rather high figure.

(7) As a result of the above, the profit before capital cost as estimated by COSENAM is as follows:

1,401,000 - 640,000 = 761,000 CFAF per day and 273,960,000 CFAF (¥301 million) per year.

3-2 Examination of Operation Plan with Voyage Account

(1) Number of Voyage Days

According to the adequate speed of the vessels, the number of voyage days will be revised from

18 days at sea + 22 days in port = total of 40 days

to

19 days at sea + 21 days in port = total of 40 days

Despite this revision, it is possible to maintain the same duration.

(2) Estimate of Revenue

When judged from the cargo flow and freight rate of the trade to which the vessels will be assigned, the freight revenue on cargo loaded at Rouen, Le Havre and Bordeaux is considerably overestimated. It is expected that the actual revenue will be less by 19,000,000 CFAF per voyage. Therefore, in order to maintain the projected revenue, it will necessary to increase the loading by 700 tons for the southbound trip. In this case, COSENAM's southbound loading share will become approximately 40%.

(3) Cargo Expense

It is believed that COSENAM's estimate has failed to include the northbound cargo unloading expense.

It will be necessary to add the container rental cost of 1,800,000 CFAF voyage.

Cargo expense will be increased by the amount of increase in southbound cargo loading.

(4) Bunker Cost

The bunker cost will be reduced because of less fuel consumption and revision of bunker price to the actual price.

(5) Port Expense

Port expense of roughly 1,000, 000 CFAF per port of call, totalling 1,000,000 CFAF x 8 = 8,000,000 CFAF, should be estimated.

(6) Agency Commission

For northbound general cargo, a figure of 6% should be reckoned.

(7) Claim

Adjustment in accordance with revision of freight is necessary.

(8) General Administration Expense

Through efforts to economize on cost, the general administration expense should be reduced to 6.5% of the freight revenue.

(9) Gross Operation Profit

As a result of the above, the voyage account will be estimated as shown in the attached Charter Base Account (Table V-3-1).

Freight Revenue

	(1,000 CFAF)	
Southbound	81,350	(cargo tonnage 4,400 F/T)
Northbound	41,000	(cargo tonnage 8,600 F/T)
Total	122,350	

Voyage Cost

Cargo expense	39,225
Bunker cost	13,407
Port expense	8,000
Agency commission	6,061
Claim	3,459
General administration expense	7,953
Miscellaneous	40
Total	78,145
Voyage profit	44,205

Table V-3-1 Charter Base Account ~~XXXXX~~, Estimate) Round

M.S./S. " Maru" Voy.No. _____ ~~XXXXXX~~

Date 19

From / /19 . To / /19 .

Loading/Discharging Port	Description	F/Tons	Freight Earnings		Cargo Expense		Agency Fee	
Antwerp	I&S	700	@ 12.5	8,750	@ 4	4,000	% 6	525
"	GC	300	23	6,900			6	414
Dunkirk	I&S	1,100	11.5	12,650	@ 3.4	4,760	6	759
"	GC	300	23	6,900			6	414
Rouen	GC	900	23	20,700	4.6	4,140	6	1242
Le Havre	GC	800	23	18,400	7.5	6,000	6	1104
Bordeaux	GC	300	23.5	7,050	4.75	1,425	6	423
Discharge		4,400			2.25	9,900		
Dakar/Europe	PHOS	8,000	4	32,000	0375	3,000	2	640
" / "	GC	600	15	9,000	7	4,200	6	540
Total				122350		37,425		6061

Pt. Charges	Port	Distance	Days at Sea	Days in Port
	Antwerp			1.5
		90	0.3	
	Dunkirk			2.0
		145	0.5	
	Rouen			1.5
		70	0.2	
	Le Havre			1.0
		614	1.7	
	Bordeaux			1.0
		2,260	6.3	
	Dakar			4.0
		2,260	6.8	
				2.0
	Bordeaux			3.0
		614	1.7	
	Le Havre			1.0
		230	0.6	
	Antwerp			0.5
			0.9	
	Margin			3.5
	Total	6,283	19.0	21.0
Consumption per day	K/T~~XX~~		15.5	1.5
	K/T~~XX~~		295	32
D/W	TS	Speed	Knots	

Voyage Expenses ( )		
Port Charges		8000
Cargo Expense		374225
Hold Cleaning/Dunnage, etc.		
Container Cost		18000
Agency Fee		
Commission		60661
Brokerage		
Despatch Money		
Claim Money	South Bound	32554
XXX	North Bound	20054
Office Expense	6.5%	795353
Sundries		4000
B/O	327 x 41	1340700
F/W		
L/O		
Total		7814145
Freight Earnings		12235000
Balance		4420855
Charterage		
Profit or Loss		
Depreciation		
Net Profit or Loss		

	Out Home	Round Voyage
Total days for a Voyage		40
Earnings per day		
Earnings per month		
C/B	1,105,000 CFAF/Day	
=	$5,390/Day	
H/B (C/R)		
Depreciation		

The daily voyage profit becomes 1,105,000 CFAF = US$5,390.

The annual voyage profit will be 44,205 x 9 (voyages) = 397,845,000 CFAF.

(10) Ship Cost

COSENAM's plan is to assign a crew of 25 persons. Under this operation plan, the number of port calls is so many that shipboard work will be very busy. However, if shipboard jobs are conducted with efficiency, it will be possible to do the work with a crew of 25.

COSENAM's estimate of the ship cost consists only of the crew cost, repairs and vessel insurance. The ship cost as worked out by the survey team according to the usual method is given in Tables V-3-2 and 3 (annual base).

(11) Profit Before Payment of Capital Cost

The annual profit before payment of capital cost in the initial year is as follows:

	Plan "A"	Plan "B"
Yearly voyage profit	397,845,000 CFAF	397,845,000 CFAF
Ship's cost	-154,173,000 CFAF	-149,855,000 CFAF
Profit before capital cost	243,672,000 CFAF	247,990,000 CFAF

The profit before payment of capital cost for each of the 20 years is shown under the section on financial evaluation.

Table V-3-2 Estimation of Ship's Cost Based on Plan "A"

(Unit: 1,000 CFAF)

Year	Crew Wage	Reparing Cost	Lub-Oil	Provisions	Insurance	Others	Total
1	77,563	26,818	7,474	12,182	24,136	6,000	154,173
2	77,563	28,159	7,474	12,182	24,136	6,000	155,514
3	77,563	29,567	7,474	12,182	24,136	6,000	156,922
4	77,563	37,254	7,474	12,182	24,136	6,000	164,609
5	77,563	32,597	7,474	12,182	24,136	6,000	159,952
6	77,563	34,227	7,474	12,182	24,136	6,000	161,582
7	77,563	35,939	7,474	12,182	24,136	6,000	163,294
8	77,563	45,283	7,474	12,182	24,136	6,000	172,638
9	77,563	39,622	7,474	12,182	24,136	6,000	166,977
10	77,563	41,604	7,474	12,182	24,136	6,000	168,959
11	77,563	43,684	7,474	12,182	24,136	6,000	171,039
12	77,563	55,041	7,474	12,182	24,136	6,000	182,396
13	77,563	48,161	7,474	12,182	24,136	6,000	175,516
14	77,563	50,569	7,474	12,182	24,136	6,000	177,924
15	77,563	53,098	7,474	12,182	24,136	6,000	180,453
16	77,563	66,903	7,474	12,182	24,136	6,000	194,258
17	77,563	58,540	7,474	12,182	24,136	6,000	185,895
18	77,563	61,467	7,474	12,182	24,136	6,000	188,822
19	77,563	64,541	7,474	12,182	24,136	6,000	191,896
20	77,563	81,321	7,474	12,182	24,136	6,000	208,676
Total	1,551,260	934,395	149,480	243,640	482,720	120,000	3,481,495

Table V-3-3 Estimation of Ship's Cost Based on Plan "B"

(Unit: 1,000 CFAF)

Year	Crew Wage	Reparing Cost	Lub-Oil	Provisions	Insurance	Others	Total
1	77,563	24,545	7,474	12,182	22,091	6,000	149,855
2	77,563	25,772	7,474	12,182	22,091	6.000	151,082
3	77,563	27,061	7,474	12,182	22,091	6,000	152,371
4	77,563	34,097	7,474	12,182	22,091	6,000	159,407
5	77,563	29,835	7,474	12,182	22,091	6,000	155,145
6	77,563	31,326	7,474	12,182	22,091	6,000	156,636
7	77,563	32,893	7,474	12,182	22,091	6,000	158,203
8	77,563	41,445	7,474	12,182	22,091	6,000	166,755
9	77,563	36,264	7,474	12,182	22,091	6,000	161,574
10	77,563	38,077	7,474	12,182	22,091	6,000	163,387
11	77,563	39,981	7,474	12,182	22,091	6,000	165,291
12	77,563	50,376	7,474	12,182	22,091	6,000	175,686
13	77,563	44,079	7,474	12,182	22,091	6,000	169,389
14	77,563	46,283	7,474	12,182	22,091	6,000	171,593
15	77,563	48,597	7,474	12,182	22,091	6,000	173,907
16	77,563	61,233	7,474	12,182	22,091	6,000	186,543
17	77,563	53,579	7,474	12,182	22,091	6,000	178,889
18	77,563	56,258	7,474	12,182	22,091	6,000	181,568
19	77,563	59,070	7,474	12,182	22,091	6,000	184,380
20	77,563	74,429	7,474	12,182	22,091	6,000	199,739
Total	1,551,260	855,200	149,480	243,640	441,820	120,000	3,361,400

4. Financial Evaluation and Socio-Economic Effect

4-1 Financial Evaluation

The internal rate of return was computed on the assumption that the vessels under this program will be assigned continuously for 20 years to the Dakar-Antwerp/Bordeaux-Dakar liner trade as planned by COSENAM.

The operating profit and ship expenses in the trial calculation of the survey team are both as of August 1980. Of course, over the long course of 20 years, expenses will naturally increase because of inflation. Judging from the actual past trend of the shipping market, however, the rise in operating expenses and ship's expenses caused by inflation is covered by an appropriate raise in the freight rate.

Thus, the model for calculating the internal rate of return was as follows:

(a) The operating profit will remain on the same level for 20 years, and

(b) The increase in ship's expenses will consist of only the increase in the repair expenses resulting from the aging of the vessels.

The following values were used for the ship price estimate, the foreign exchange rate and residual value:

Ship price estimate: Ship price based on delivery in Mid. 1982

Foreign exchange rate: Rate as of July 1980, i.e.,

US$1.00 = 205 CFAF = ¥225.50

Residual value after 20 years: 5% of contracted ship price.

The internal rate of return obtained on the basis of the above premise is as follows:

1) Plan "A" (vessel specifications planned by Senegalese side)-- 5.89%

2) Plan "B" (revised plan of survey team) -- 7.32%

4-2 Socio-Economic Effect

4-2-1 Effect of Improving International of Balance: Payments

The freight revenue under this project will be either all foreign currency receipts or savings of foreign exchange payments. A greater part of the operating expense payments will be in foreign exchange or will have the same effect as foreign exchange payments.

Consequently, according to the trial calculation of the survey team,

the effect of improvement of the international balance of payments per year per ship will 470 million CFAF. Therefore, the total effect by this project will be 940 million CFAF annually before capital expediture.

In the case of this project, part of the crew assigned to the vessels will be foreign nationals, and the vessels will be built with borrowed foreign capital. Therefore, the net effect of improvement of the international balance of payments will be obtained after subtracting the following two items:

a) Transfer disbursements: Payment of wages to foreign crew, etc.

b) Capital expenditure: Interest payment, repayment of principal

4-2-2 Effect on Income and Employment

It is expected that this project will have the effect of creating employment and providing income to the Senegalese people through employment of domestic office staff, ship's crew, and workers needed for repairing the two vessels at Dakar Marine.

The wage level of the crew will be several times higher than that of ordinary workers in Senegal. Therefore, there will occur the effect of redistribution of income.

Table V-4-1 Estimation of Profit and I.R.R. Based on Plan "A"

Ship-Building Price: 2,681,818,000 CFAF

I.R.R. = 5.8905029%

(Unit: 1,000 CFAF)

Year	A Freight Earning	B Voyage Cost	C General Administrative Cost	D Voyage Profit A - (B + C)	E Ship's Cost	F Profit before Capital Cost D - E	Net Present Value	Year
1	1,101,150	631,728	71,577	397,845	154,173	243,672	230,117.0	1
2	1,101,150	631,728	71,577	397,845	155,514	242,331	216,120.0	2
3	1,101,150	631,728	71,577	397,845	156,922	240,923	202,911.8	3
4	1,101,150	631,728	71,577	397,845	164,609	233,236	185,510.1	4
5	1,101,150	631,728	71,577	397,845	159,952	237,893	178,688.5	5
6	1,101,150	631,728	71,577	397,845	161,582	236,263	167,592.1	6
7	1,101,150	631,728	71,577	397,845	163,294	234,551	157,122.4	7
8	1,101,150	631,728	71,577	397,845	172,638	225,207	142,470.8	8
9	1,101,150	631,728	71,577	397,845	166,977	230,868	137,927.4	9
10	1,101,150	631,728	71,577	397,845	168,959	228,886	129,136.5	10
11	1,101,150	631,728	71,577	397,845	171,039	226,806	120,844.7	11
12	1,101,150	631,728	71,577	397,845	182,396	215,449	108,407.8	12
13	1,101,150	631,728	71,577	397,845	175,516	222,329	105,646.5	13
14	1,101,150	631,728	71,577	397,845	177,924	219,921	98,689.0	14
15	1,101,150	631,728	71,577	397,845	180,453	217,392	92,127.3	15
16	1,101,150	631,728	71,577	397,845	194,258	203,587	81,477.5	16
17	1,101,150	631,728	71,577	397,845	185,895	211,950	80,105.9	17
18	1,101,150	631,728	71,577	397,845	188,822	209,023	74,605.0	18
19	1,101,150	631,728	71,577	397,845	191,896	205,949	69,418.7	19
20	1,101,150	631,728	71,577	397,845	208,676	189,169	60,215.7	20
Total	22,023,000	12,634,560	1,431,540	7,956,900	3,481,495	4,475,405	2,639,134.7	Total
					Residual Value	134,091	42,683.4	
						4,609,496	2,681,818.1	

Table V-4-2 Estimation of Profit and I.R.R. Based on Plan "B"

Ship-Building Price: 2,454,545,000 CFAF

I.R.R. = 7.316736%

(Unit: 1,000 CFAF)

Year	A Freight Earning	B Voyage Cost	C General Administrative Cost	D Voyage Profit A - (B + C)	E Ship's Cost	F Profit before Capital Cost D - E	Net Present Value	Year
1	1,101,150	631,728	71,577	397,845	149,855	247,990	231,082.3	1
2	1,101,150	631,728	71,577	397,845	151,082	246,763	214,262.0	2
3	1,101,150	631,728	71,577	397,845	152,371	245,474	198,610.9	3
4	1,101,150	631,728	71,577	397,845	159,407	238,438	179,765.2	4
5	1,101,150	631,728	71,577	397,845	155,145	242,700	170,503.2	5
6	1,101,150	631,728	71,577	397,845	156,636	241,209	157,902.4	6
7	1,101,150	631,728	71,577	397,845	158,203	239,642	146,180.9	7
8	1,101,150	631,728	71,577	397,845	166,755	231,090	131,353.5	8
9	1,101,150	631,728	71,577	397,845	161,574	236,271	125,142.1	9
10	1,101,150	631,728	71,577	397,845	163,387	234,458	115,715.2	10
11	1,101,150	631,728	71,577	397,845	165,291	232,554	106,950.3	11
12	1,101,150	631,728	71,577	397,845	175,686	222,159	95,203.8	12
13	1,101,150	631,728	71,577	397,845	169,389	228,456	91,227.5	13
14	1,101,150	631,728	71,577	397,845	171,593	226,252	84,187.6	14
15	1,101,150	631,728	71,577	397,845	173,907	223,938	77,645.4	15
16	1,101,150	631,728	71,577	397,845	186,543	211,302	68,269.1	16
17	1,101,150	631,728	71,577	397,845	178,889	218,956	65,918.9	17
18	1,101,150	631,728	71,577	397,845	181,568	216,277	60,673.1	18
19	1,101,150	631,728	71,577	397,845	184,380	213,465	55,801.4	19
20	1,101,150	631,728	71,577	397,845	199,739	198,106	48,255.7	20
Total	22,023,000	12,634,560	1,431,540	7,956,900	3,361,400	4,595,500	2,424,650.5	Total
					Residual Value	122,727	29.894.5	
						4,718,227	2,454,545.0	

5. Conclusion

As a result of making the necessary investigations and surveys, the survey team came to the following conclusion.

5-1 Feasibility of this Project

In the case of the ship's specification planned by Senegalese side (Plan "A"), there are still problems that must be solved technically and the internal rate of return is not necessarily high. Therefore, Plan "A" does not appear to be quite as feasible.

In the case of the revised plan (Plan "B"), the team can say that it has sufficient feasibility, if adequate attention is given to the points to be explained below which require consideration in the way of business management.

5-2 Survey Team's Opinion

(1) It is desirable that this project should be carried out as soon as possible. Because Senegal's possession of its own tonnage would, from the standpoint of national economy, contribute greatly to the improvement of the balance of payments situation and at the same time would bring about fiscal stability in corporate business management.

It is desired, therefore, that Senegal review its ship specifications as soon as possible and flexible measures should be taken whilst taking into full consideration the situation of the shipbuilding market today.

(2) It will be necessary to pay attention to the following points as regards business management of this project.

(Line's Management)

(a) Because it is difficult to produce profit from cross trade, the calling ports in West Africa should be limited to only one, that is, Dakar. Advance to the Gulf of Guinea should be studied with utmost prudence.

(b) The shipping schedule should be maintained strictly.

(c) The interval between the two ships in operation should be kept at an appropriate length of time.

(d) Efforts must be made to increase the freight rate at a proper level in accordance with operational cost infration through cooperation with member lines of shipping conference.

(e) Efforts must be made to collect extensively in advance information concerning the flow of cargo, particularly, movements of cargo concerned with Senegal's public corporations and enterprises and utilize it for acquiring profitable cargoes.

(Ship's Operation)

(f) Cargo handling know-how should be accumulated to increase seamen's knowledge of cargo handling.

(g) Adequate attention must be paid to the supervision of cargo in transport, and utmost attention must be paid to prevent cargo damage.

(Accounting)

(h) Cargo must be taken to shorten the period for collecting freight bills and prevent failure in collecting them.

(i) The fixed cost, such as general administrative expenses and ship's cost, should be held down as much as possible through controlled budget and other means.