BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR CONSTRUCTION
OF
MULTIPURPOSE CARGO VESSEL
IN
THE REPUBLIC OF KIRIBATI

MAY 1991

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the Republic of Kiribati, the Government of Japan decided to conduct a basic design study on the Project for Construction of Multipurpose Cargo Vessel in the Republic of Kiribati and entrusted the study to the Japan International Cooperation Agency (JICA).

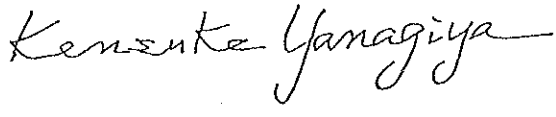
JICA sent to Kiribati a study team headed by Mr. Minoru Kitahara, Deputy Director, Ship Machinery Industries Division, Maritime Technology and Safety Bureau, Ministry of Transport, from December 4 to December 26, 1990.

The team held dicussions with the officials concerned of the Government of Kiribati, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission (headed by Mr. Toshisuke Fujita, Director of Nuclear Technology Office, Technology Division, Maritiime Technology and Safety Bureau, Ministry of Transport,) was sent to Kiribati in order to discuss a draft report and the present report was prepared.

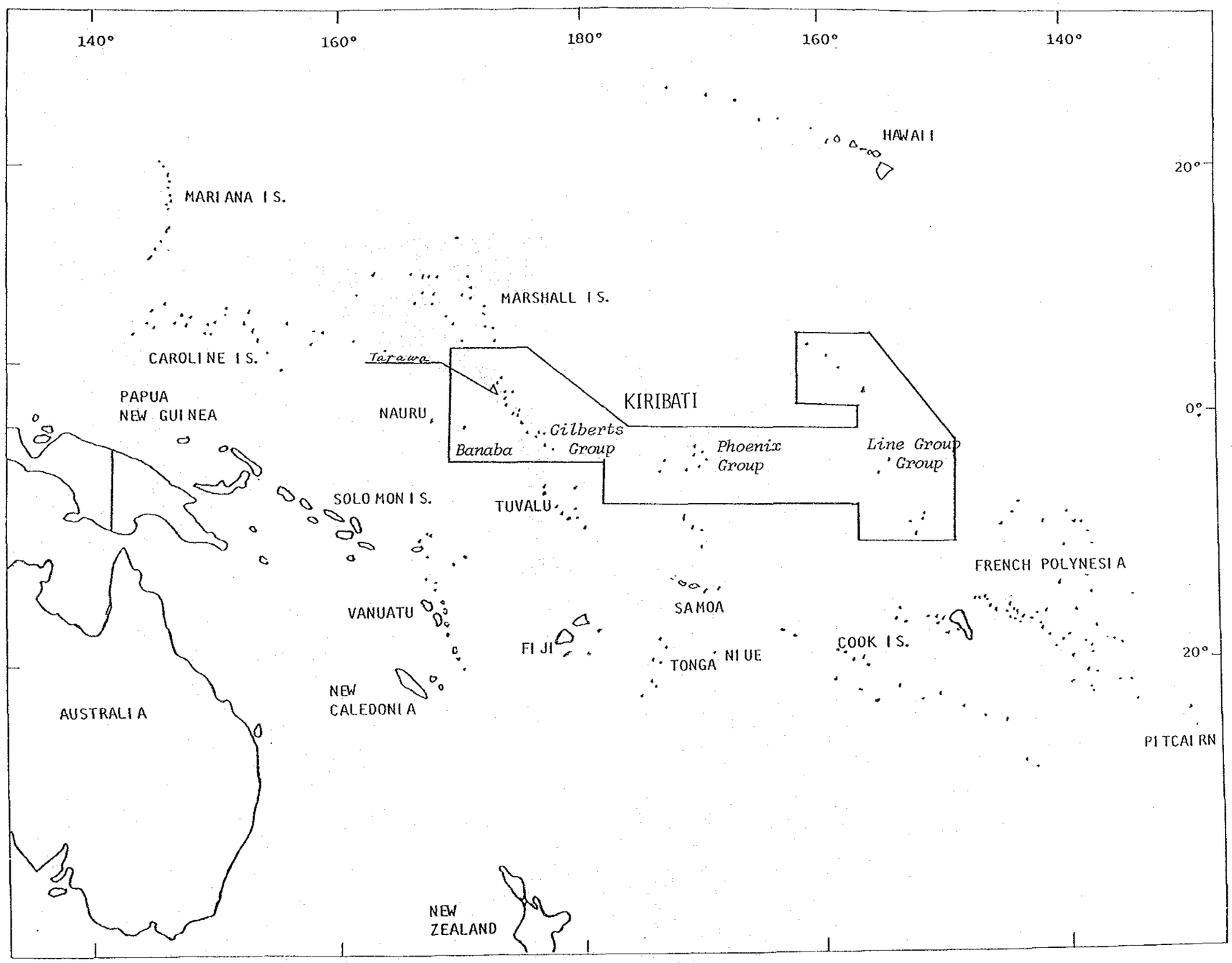
I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Kiribati for their close cooperation extended to the teams.

May 1991



Kensuke Yanagiya
President
Japan International Cooperation Agency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HAWAII
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Tarawa
PAPUA
NEW GUINEA
NAURU
KIRIBATI
Gilberts
Group
Banaba
Phoenix
Group
Line Group
Group
SOLOMON I S.
TUVALU
FRENCH POLYNESIA
VANUATU
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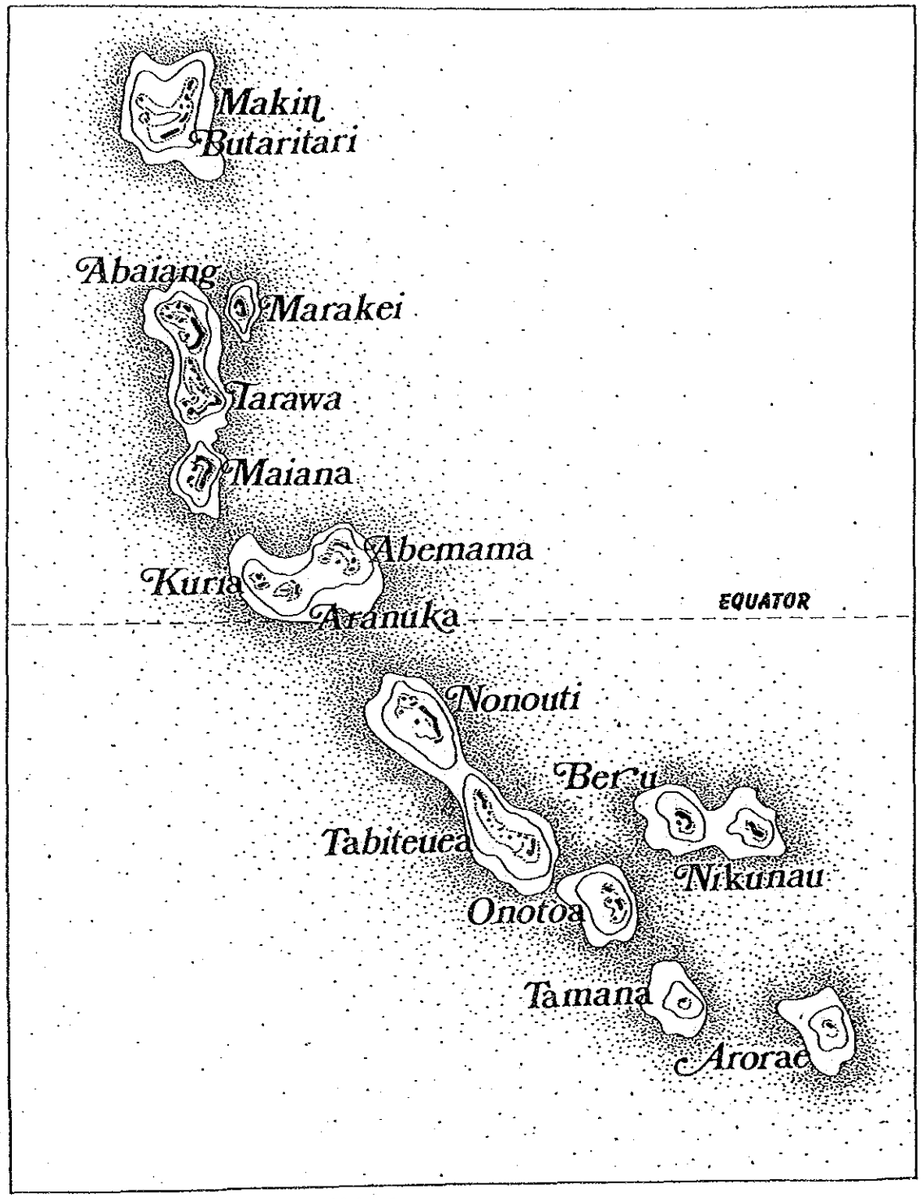
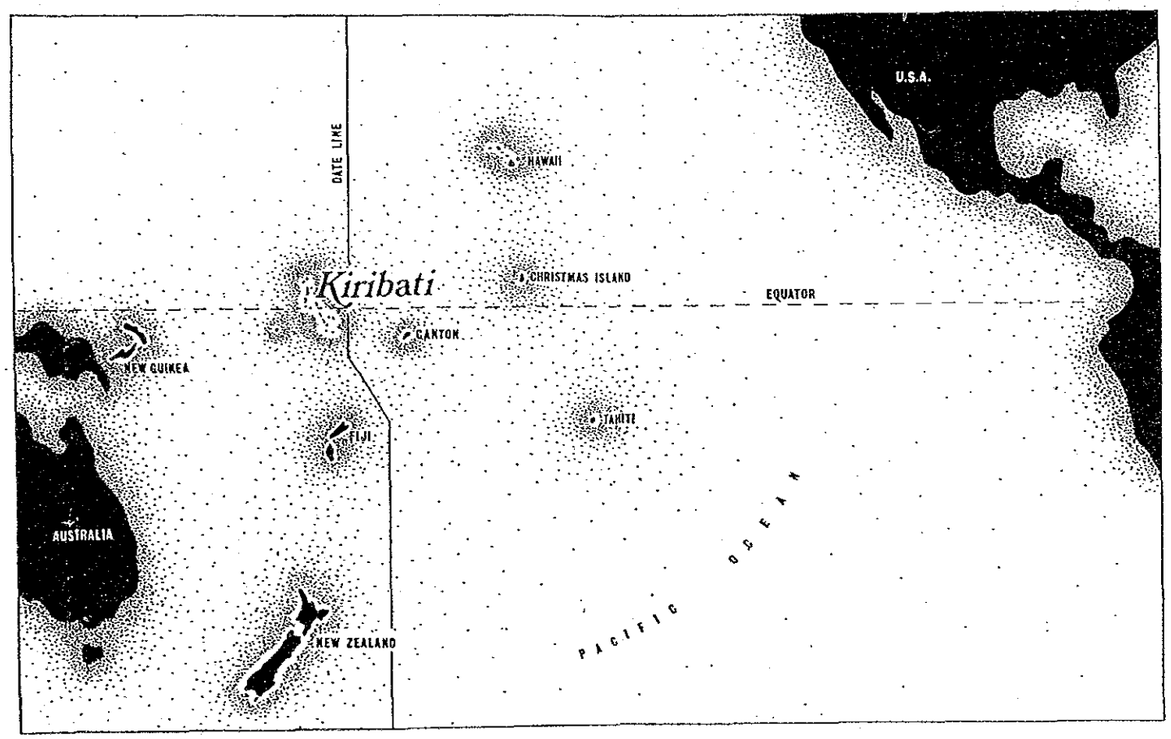


Kiribati . . . . the central chain of islands.



The Pacific.

SUMMARY

Summary

The Republic of Kiribati consists of 33 islands divided into three groups: the Gilbert, Phoenix, and Line Islands. These are scattered in the central southern Pacific north and south of the Equator and east and west of the International Date Line. Most of the islands are small and are situated atop coral reefs. Except for copra and small amounts of other agricultural products, the fish caught in the surrounding waters are the only produce of the country. Consequently, Kiribati is obliged to import foodstuffs as well as sundries, industrial products, etc. The republic's exports are limited to copra and a small quantity of marine products.

Because the other islands lack suitable harbors, all of Kiribati's imports are delivered to the Port of Betio in Tarawa, the capital of the country. From Betio, imports are transported to the other islands. As for copra, the main export, it is transported from the other islands and collected at Betio. From Betio the outlying islands' copra is exported along with a small amount produced on Tarawa.

The cargo traffic of Kiribati is mostly conducted by sea, excluding air freight carried domestically. International transport is effected mainly by foreign vessels, while domestic transport is mostly conducted by ships belonging to the state-run Shipping Corporation of Kiribati (SCK).

Because the amount of cargo is insufficient for the allocation of freighters, privately-owned foreign shipping lines are depended upon to provide service on an irregular basis. The procurement time for imports, therefore, cannot be pinpointed, and this produces negative effects on industrial activity.

In addition, international freight traffic has been trending toward a departure from conventional bulk transportation and into containerized transport. In Kiribati, also, most imported cargo has become containerized, but because there is no ship of Kiribati registry that can handle containers, the dependence on foreign bottoms has increased. With this, the republic's economic burden is also rising.

The population of Kiribati is expanding at a high rate. In accordance with this, as well as with the promotion of the outer islands' development and the resettlement program to cope with the overconcentration of people in the Gilberts, imported cargo and seaborne cargo traffic in general to the outer islands are rising significantly.

Amid this situation the Shipping Corporation of Kiribati has been engaging in marine transportation services by means of the Moanaraoi and two other 500-ton passenger-cargo vessels (one of which was constructed in 1984 using Japanese grant aid). The main ship, the Moanaraoi, however, is a superannuated vessel constructed in 1958 and now more than 33 years old. In recent years, its net working rate has been declining each year because of lengthening repair layups, which have adversely affected SCK's accounts. Until 1988 the Moanaraoi engaged not only in domestic interisland cargo traffic, but also in hauling exports and imports. In October 1988, however, the ship lost its international license because of the vessel's decrepit condition.

To offset the decline in transportation capacity, the government of Kiribati decided in 1987 as part of its National Development Plan to replace the Moanaraoi with a new, multipurpose passenger-cargo vessel. This vessel would have similar transportation capacity and would be equipped to handle both bulk and containerized cargo to cope with the recent containerization trend. The new ship would help Kiribati recover its transportation capability. With the plan's realization, the government also expects to raise its share of the imports carried under its own flag, and thus regularize the flow of imported cargo. In light of these considerations the Kiribati government has requested Japanese government grant aid to build a new, multipurpose passenger-cargo vessel.

The Japanese government, in response to the request, has decided to conduct a basic design study. Accordingly, the Japan International Cooperation Agency (JICA) dispatched a study team to Kiribati from December 4 to 26, 1990. The study team, through consultations with the Kiribati government and executive agencies, plus a field investigation, confirmed the contents of the request, collected information, etc.

After returning from their on-the-spot investigation, the study team in Japan analyzed the data. To present an explanation and to confirm the Draft Final Report to the Kiribati government and to the authorities of the Shipping Corporation of Kiribati, the study team was dispatched to Kiribati for consultations from April 2 through 14, 1991. Below is an outline of the study results.

(1) Almost all of Kiribati's cargo traffic is carried by sea, excluding some domestic airline transportation.
Although domestic cargo traffic is mostly dependent on the three ships that belong to the state-run Shipping Corporation of Kiribati, the rate of operation of the major ship, Moanaraoi, has been declining because of the longer repair periods required for the superannuated vessel. Repair costs are substantial, averaging A$330,000 per annum over the past three years.

(2) Kiribati has been experiencing a drastic increase in population (up 2.3% in 1990). The promotion of outer islands' development as well as of the resettlement program to cope with the population concentration in the Gilberts has also contributed to annually increased imports and sea transportation to the outer islands.
In the Kiribati archipelago, vessels that can be utilized at a small passenger fare play an important role in islanders' lives.

(3) In cargo traffic, the world trend is moving away from conventional bulk transportation and toward containers. In Kiribati, also, most cargo (80% in 1990) is carried in containers.
There is, however, no ship registered in Kiribati that can deal with containerized cargo. The republic becomes more and more dependent upon foreign ships, which results in an enlarged economic burden. To conserve foreign currency, it is necessary to enhance the cargo share of Kiribati-registered vessels.

(4) As a ship repair facility, Kiribati has the Betio shipyard. This, however, has a slipway for only 100 weight tons or less, and large ships must be repaired offshore.
Ships of Kiribati of 100 weight tons or more are taken for repair to the Fiji National Shipyard. The shipyard in Fiji, however, accommodates

vessels of no more than 1,000 weight tons.

In planning the new multipurpose passenger-cargo vessel, the proper scale of the ship has been decided, taking into account the above-mentioned conditions. (List to be inserted here)

Length (between perpendiculars)	about 63 meters
Width (molded)	about 11.8 meters
Depth (molded)	about 5.9 meters
Gross tonnage (international)	about 1300 tons
Deadweight tonnage	about 1000 tons
Speed	about 10 knots
Container-carrying capacity	39 containers
	(6 of them refrigerated)
Complement (persons)	
Crew and seamen cadets	30 persons
Passengers	56 persons
Total	86 persons
Cargo gear	25-ton derrick boom x 2

For the implementation of this project, Kiribati will shoulder none of the costs.

A total of 17 months will be required for completion: about three months for detail design, about two months for tenders, and about 12 months for construction (including about one month for the delivery voyage) after making construction contracts.

The completion of the project would help to solve problems concerning the irregular schedule of shipping services between Tarawa and the Line Islands--problem as a result of the deterioration of the Moanaraoi. The new vessel would ensure smooth transportation of passengers and cargo, and promote implementation of the resettlement project to the northern Line Islands and diffusion of the Gilbert Islands' population--all of which would be beneficial to the people's lives. As for interisland passenger and cargo traffic among the Gilberts, the Nei Momi and the Nei Mataburo

would conduct the exclusive route service. If the new, multipurpose passenger-freighter vessel added four more route services a year, it could cover the paucity of transport capacity during each vessel's repair layups.

In addition, the Shipping Corporation of Kiribati is planning to sail the new vessel to Fiji twice a year. This should help to increase the share of imports transported by Kiribati's own shipping as well as greatly to contribute to the stable flow of imports.

Moreover, along with the Nei Mataburo, the new, multipurpose passenger-cargo vessel will be utilized throughout the year for training cadets from the Marine Training Center. This will greatly enhance the effectiveness of the cadets' training.

The executive agency, SCK, is safely operating three passenger-cargo vessels at present, and has a sufficient number of qualified seamen. The corporation has abundant experience in operating, maintaining, and managing ships.

In consideration of the above-mentioned beneficial effects and economic advantages for various sectors, this project is extremely appropriate as grant aid. After implementation of the project, it is expected that the following three points should be improved and examined as future issues, in view of the planned vessel's further utilization.

1. For the spare components necessary for maintenance and repair of the ship as well as for other machines and material generally used for vessels, SCK is required constantly to grasp the stock and to secure the necessary items.

2. SCK is required to establish an appropriate management system for the containers in the company's possession.

3. Harbor facilities are to be renovated to cope with containerization.

BASIC DESIGN STUDY REPORT ON THE PROJECT
FOR CONSTRUCTION OF MULTIPURPOSE CARGO VESSEL
IN THE REPUBLIC OF KIRIBATI

CONTENTS

CHAPTER 1 INTRODUCTION

Chapter 1 Introduction

The Republic of Kiribati consists of groups of islands scattered about the central southern Pacific. Because the islands are situated atop coral reefs, they produce nothing but copra, a small quantity of other agricultural products, and fish caught in the surrounding waters. Consequently, Kiribati must import foodstuffs as well as sundries, industrial products, etc.

Most of the cargo transportation of Kiribati is conducted by ships, except for some domestic air carriage. International transportation is mainly performed by foreign ships, while domestic interisland transportation depends for the most part on the vessels of the state-run Shipping Corporation of Kiribati.

Because the quantity of its freight is too small to support transportation service on a regular basis, private foreign shipping concerns are obliged to provide service on an irregular basis. This irregularity inevitably results in the unreliable procurement of imports, which oftentimes hinders industrial activity. Moreover, the world cargo system has been changing from conventional bulk transportation to containerization, and most of the cargo imported into Kiribati is containerized. There is no ship registered in Kiribati that can deal with containerized cargo, and thus the republic is dependent upon foreign bottoms, which adversely affects the economy.

Kiribati has been experiencing a rapid increase in its population. The promotion of outlying islands' development and the resettlement scheme for diffusing the Gilberts' population heighten the volume of imported cargo and interisland seaborne freight.

Under these circumstances, three passenger-cargo vessels belonging to SCK have engaged in marine transport. One of them, however, the Moanaraoi, is incurring excessive repair costs because of its superannuated 33 years of operation, and in 1988 lost its international license.

For these reasons the Kiribati government requested the Japanese government to grant aid to replace the Moanaraoi with a new, multipurpose passenger-cargo vessel capable of handling both bulk and containerized cargo.

In response to this request, the Japanese government has decided to conduct a basic design study. To implement the study, from December 4 to 26, 1990 the Japan International Cooperation Agency dispatched a study team headed by Mr. Yutaka Kitahara, the Deputy Director of the Ship Machinery Industries Division of the Maritime Technology and Safety Bureau of the Ministry of Transport.

The study team conducted research on the actual situation of Kiribati's maritime transport, its harbor facilities, SCK's management, the administration of the shipping operations, and their maintenance situations. The research included thorough discussions in Tarawa with officials of Kiribati's Ministry of Transport and Communications and SCK. The team also investigated the Line Islands' resettlement project, the education and training of seamen, and Fiji's ship-repair facilities.

The JICA sent its Draft Final Report Study Team to Kiribati from April 2 to 14, 1991, and explained and confirmed the draft final report to officials of the Kiribati government.

The minutes of the discussion in the Kiribati research, a roster of the study team, the research schedule, and other relevant material are included in the Appendix.

CHAPTER 2 BACKGROUND OF THE PROJECT

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2.1 OUTLINE OF CARGO/PASSENGER TRANSPORTATION

2.1.1 General Situation

In Kiribati, passenger and cargo transportation, is under control of the Ministry of Transport and Communications, and the maritime transportation between outer islands is chiefly conducted by the Shipping Corporation of Kiribati (SCK), with some help of private-sector shipping companies. The domestic air transport service is run by Air Tungaru flying between the outer islands of the Gilbert Islands. Both the SCK and Air Tungaru are 100% government supported.

For the Kiribati islands located far from the others, there is no air-service for Banaba island, the Line groups and the Phoenix groups, and they depend on vessels for transportation. All three airplanes belonging to Air Tungaru are of the small type with only very small cargo transport capacities, but they carry about 75% to 80% of all the passengers among the Gilbert Islands, which means that most passengers travel by air.

Only a small part of international cargo/passenger transportation is conducted by the Shipping Corporation of Kiribati, and they heavily rely on foreign airline and shipping companies both for passenger transportation and for cargo transportation. Partly, Air Tungaru once a week flies a B737 airplane of Aloha-Hawaii Airlines between Honolulu, Hawaii, and the Christmas Islands.

The Shipping Corporation of Kiribati has a plan to strengthen the transporting capacity between outer islands and to increase the share of domestic vessels in the import/export cargo transportation, so that they may best eliminate the uncertainty of cargo transportation. Air Tungaru is planning to extend their present Hawaii-Christmas Islands air service to reach Nandi, Fiji via Tarawa.

Land transport of cargo and passengers are conducted by private sectors, and some private bus companies are in operation in Tarawa. The maritime

transportation of fresh fish and other seafoods from the seas around Kiribati, is done independently by Te Mautari Ltd. (fishing corporation), separately from the above-mentioned cargo transportation.

2.1.2 Kiribati Vessels and Their Services

The vessels, except small canoes and fishing boats, registered in Kiribati are as listed in Table 2.1.1 below.

TABLE 2.1.1: Registered Kiribati Vessels

Name of Vessel	Year	Owner	GRT	Comments
MOANARAOI	1958	SCK	721	Pax/cargo vessel, Out of class
NEI MOMI	1982	SCK	540	Pax/cargo vessel
NEI MATABURO	1984	SCK	540	Pax/cargo vessel with facilities for 12 cadets plus an instructor (Japanese grant aid in 1983)
TITUABINE	1979	SCK	57	Landing craft
NIMANOA	1978	SCK	57	Landing craft
TERAOI	1978	SCK	65	Tugboat
RIKI	1974	SCK	19	Tugboat
T. RIIKI	1975	SCK	19	Tugboat
TOVATA	1956	WAYSANG KUMKEE	352	Pax/cargo vessel
MAT 1	1952	MOTE TERAOI	300	Pax/cargo vessel
NAREAU	1950	EFI TOFINGA	50	Pax/cargo vessel
NEI BWAE	--	ABAIANG ISLAND	25	Catamaran
TEIKARAIO	--	TEITIA REDFERN	10	Former fishing boat
M. CLARISSA	--	ABAIANG KPC	28	Catamaran

SOURCE: Ministry of Transport & Communications

The Moanaraoi is the largest vessel in Kiribati, but 30 years have passed since its construction. They renovated and repaired this vessel in 1988; however, because of its old age the repair and maintenance could never be completed, and it lost its classification from German Lloyd. At present, it is engaged in domestic cargo transportation among the outer islands including the Line Islands and the Phoenix Islands. The Nei Momi and the Nei Mataburo are sister vessels. Their ages are 8 and 6, respectively, and they are fully utilized for cargo/passenger transportation among the outer islands.

The two cargo/passenger vessels of the landing craft type owned by the Shipping Corporation of Kiribati are transporting passengers and cargo to neighboring outer islands around Tarawa; and the three tugboats, together with four non-self-propelled barges, are transporting cargo (mostly containers) in Port Betio.

Of the privately-owned vessels, the Tovata, the Mat I and the Nareau are transporting passengers and cargo among the outer islands, and occasionally the Mat I, as a government-chartered vessel, is engaged in the transport to Christmas island.

The Nei Bwae, the Teikaraio and the M. Clarissa are mainly transporting passengers and cargo to Abaiang island, the closest island to Tarawa.

2.1.3 Passenger Transportation among Outer Islands

The passenger transportation among islands, as mentioned above, is conducted by airplanes (within the Gilbert Islands only) and by vessels, both with Tarawa island as the center. The actual number of passengers getting on and off, including those going between the outer islands, are shown in Table 2.1.2 below.

TABLE 2.1.2: Domestic Passengers among Outer Islands

(number of people)

	1984	1985	1986	1987	1988	1989	1990
Maritime Trans.	5,485	7,523	7,034	8,785	8,861	9,442	9,819
Air Trans.	23,167	23,998	25,331	27,130	27,431	N.A	N.A
Total	28,652	31,521	32,365	35,915	36,292	N.A	N.A
% of Maritime Trans	19 %	24 %	22 %	24 %	24 %		

SOURCE: Kiribati Statistical Yearbook 1988 and SCK Materials of 1989

[NOTES] 1. Listed above are the total number of the passengers embarking and disembarking.

2. Maritime transportation includes the passengers between Banaba, Line, Phenix Islands.

Now the transportation by vessels among islands in Kiribati is discussed below.

In 1984, the total number of passengers was about 5,500, which reached some 9,800 in 1990, an increase by about 80%. Of this 9,800 passengers, 4,589 (47%) embarked at Port Betio, 4,078 (41%) disembarked there,and the remaining 1,152 (12%) embarked and disembarked at other islands. Betio Port is the center of passenger transportation.

Table 2.1.3 classifies figures according to each of the areas. The Gilbert Islands account for 8,566 passengers (87.2%), Banaba island for 206 (2.1%), the Line Islands for 1,029 (10.5%), and the Phoenix Islands for 18 (0.2%). The reason for the increase of the passengers related to the Line Islands in 1990 is that the figure includes the emigrants to Washington island and Fanning island.

Although not included in the statistics here, the average number of ferryboat passengers was about 400,000 per year between Betio and Bairiki in Tarawa before completion of the causeway in June 1987, which were constructed by grant aid from Japan.

TABLE 2.1.3: Domestic Sea Passengers among Outer Islands

(number of people)

		1985	1986	1987	1988	1989	1990	1991 (Jan-Mar)
Gilbert Islands	Embarking at Betio	2,914	3,104	3,855	3,823	3,882	4,236	1,644
	Disembarking at Betio	2,562	2,703	3,555	3,568	3,692	3,671	1,946
	Other passengers	969	562	259	209	362	659	212
	Subtotal	6,445	6,369	7,669	7,600	7,936	8,566	3,802
Banaba island	Embarking at Betio	138	147	163	140	205	89	—
	Disembarking at Betio	183	137	116	145	119	101	—
	Other passengers	—	—	—	—	—	16	—
	Subtotal	321	284	279	285	324	206	—
Fanning islands	Embarking at Betio	222	190	267	407	144	251	136
	Disembarking at Betio	208	60	238	242	139	301	313
	Other passengers	272	88	235	205	857	477	459
	Subtotal	702	338	740	854	1140	1,029	908
Phoenix Islands (Canton Island)	Embarking at Betio	26	4	1	25	6	13	2
	Disembarking at Betio	29	2	1	14	28	5	3
	Other passengers	—	—	4	25	8	—	5
	Subtotal	55	6	6	64	42	18	10
Total	Embarking at Betio	3,300	3,445	4,286	4,395	4,237	4,589	1,782
	Disembarking at Betio	2,982	2,902	3,910	3,969	3,978	4,078	2,262
	Other passengers	1,241	650	498	439	1,227	1,152	676
	Total	7,523	6,997	8,694	8,803	9,442	9,819	4,720

SOURCE: SCK Materials

2.1.4 Cargo Transportation among Outer Islands

For cargo transportation among outer islands, the amount of transportation by plane is small, less than 200 tons per year and most of cargo transportation is conducted by sea. Although there are no statistics concerning all amounts of cargo transportation among islands, the amount of cargo loading and unloading at Port Betio on Tarawa island, which is a window of the foreign transport and a center of transportation among islands, is shown in Table 2.1.4.

The cargo loaded at Port Betio, which are delivered to outer islands, are inward cargo containing food, fuel and machines and so on. The unloadings are mainly copras for export which largely change every year, and agricultural products for the Tarawa Island. In 1989, the cargo loaded was 7,400 F/T (freight tons)(48%) and the unloaded 7,900 F/T (52%), and they almost kept a balance. However, in 1990, because the copra harvest in the Gilbert Islands was bad, the loadings were 7,100 F/T (61%) and the unloadings 4,500 F/T (39%). Although the amount of cargo loadings depend on the annual amount of transporting volume of copra, the loadings have gradually increased to the level from 5,000 F/T to 8,000 F/T since 1984, and general cargo unloaded also have slowly increased to a little more than 1,000 F/T.

TABLE 2.1.4: Handling Volume at Port Betio

(freight tons)

	1984	1985	1986	1987	1988	1989	1990	1991 (Jan-Mar)
Cargo loaded	5,433	5,943	5,713	6,424	8,415	7,380	7,134	2,446
Cargo unloaded	6,526	5,444	3,804	3,633	10,258	7,887	4,519	1,498
Copra	(5,668)	(4,334)	(2,759)	(2,806)	(8,924)	(6,641)	(3,250)	(1,034)
General cargo	(858)	(1,110)	(1,045)	(827)	(1,334)	(1,246)	(1,269)	(464)
Total	11,959	11,387	9,517	10,057	18,673	15,267	11,653	3,944

SOURCE: Kiribati Statistical Yearbook 1989 and SCK Materials

There is some domestic cargo among outer islands which are not mentioned in Table 2.1.4.

As for the regional transportation of cargo between Port Betio and outer islands, as shown in Table 2.1.5 concerning the amount of cargo shipment of each island, most of them is between Betio and the Gilbert Islands as expected, which reached to the level from 80% to 95% of total amount of cargo shipment since 1984. Cargo shipment between Tarawa and the Line Islands largely changes in every year, especially with the remarkable increase of copra transportation in 1990. It happened partly because the copra transportation, which had been transported directly to the Marshall Islands, changed destination to EC from that year on.

The amounts of cargo transportation between Port Betio and the Banaba island or the Phoenix Islands are small, and mainly consist of daily commodities for the people of the outer islands.

TABLE 2.1.5: Cargo Shipment from Port Betio to Outer Islands

(freight tons)

		1984	1985	1986	1987	1988	1989	1990	1991 (Jan-Mar)
Gilbert Islands	Loaded at Betio (B.)	4,699	4,791	4,653	5,207	6,862	6,847	6,302	2,237
	Unloaded at B.	6,106	4,241	3,023	3,480	10,069	7,670	3,511	1,333
	Copra	(5,541)	(3,315)	(2,418)	(2,806)	(8,924)	(6,540)	(2,331)	(920)
	General cargo	(565)	(926)	(605)	(674)	(1,145)	(1,130)	(1,180)	(413)
	Subtotal	10,805	9,032	7,676	8,687	16,941	14,517	9,813	3,570
Banaba Island	Loaded at B.	195	166	137	193	210	239	149	-
	Unloaded at B.	96	86	51	46	79	62	16	-
	Subtotal	291	252	188	239	289	301	169	-
Line Islands	Loaded at B.	524	872	920	1,02	1,33	287	673	209
	Unloaded at B.	323	1,061	424	107	110	155	992	165
	Copra	(117)	(1,019)	(341)	(-)	(-)	(101)	(919)	(114)
	General cargo	(206)	(42)	(83)	(107)	(110)	(54)	(73)	(51)
	Subtotal	847	1,933	1,34	1,13	1,44	442	1,665	374
Phoenix Islands	Loaded at B.	15	114	3	4		7	10	-
	Unloaded at B.	1	56	306	-		-	-	-
	Subtotal	16	170	309	4			10	-
Total	Loaded at B.	5,433	5,943	5,713	6,428	8,415	7,380	7,134	2,446
	Unloaded at B.	6,526	5,444	3,804	3,633	10,258	7,887	4,519	1,498
	Copra	(5,668)	(4,334)	(2,759)	(2,806)	(8,924)	(6,641)	(3,250)	(1,034)
	General cargo	(868)	(1,110)	(1,045)	(827)	(1,309)	(1,246)	(1,269)	(464)
Total		11,959	11,387	9,517	10,061	18,683	15,267	11,663	3,944

SOURCE: Kiribati Statistical Yearbook 1988 and SCK Materials

2.1.5 Import/Export Cargo

Although there are no statistics concerning all amounts of overseas cargo in the Republic of Kiribati, a tendency of importation and exportation in this country can be indicated by the statistics in Port Betio, as the services for importing and exporting commodities are executed mostly at this port in the Tarawa island. The trends in Port Betio are described in the following.

(1) Amount of Import/Export Cargo

As shown in Table 2.1.6, the amount of imported and exported cargo in 1984 came to about 40,000 F/T and to about 49,000 F/T in 1990, which corresponded to an increase of 22%. The imported cargo tonnage increased from about 29,000 F/T in 1984 to about 42,000 F/T in 1990, which corresponded to an increase of 45%.

Exported cargo largely varied from 4,000 F/T to 12,000 F/T in each year. This resulted from the fact that the yield of copra, which was the major export cargo, depended severely upon the amount of rainfall and the length of the dry season in each year. Except for these exported copras, imported and exported general cargo and imported fuel tended to increase gradually.

TABLE 2.1.6: Import/Export Cargo at Betio Port

(freight tons)

	1984	1985	1986	1987	1988	1989	1990	1991 (Jan-Mar)
[Import Cargo]								
General c.	22,400	20,104	32,376	28,670	27,585	29,639	35,988	7,435
Fuel	6,811	5,091	5,295	6,331	6,746	6,605	5,982	2,800
Subtotal	29,211	25,195	37,671	35,001	34,331	36,244	41,970	10,235
[Export Cargo]								
Copra	10,189	8,657	3,490	3,898	11,309	8,622	5,848	--
General c.	269	351	348	857	849	1,391	1,178	272
Subtotal	10,458	9,008	3,838	4,755	12,158	10,013	7,026	272
Total	39,669	34,203	41,509	39,756	46,489	46,257	48,996	10,507

SOURCE: Kiribati Statistical Yearbook 1988 and SCK Materials

(2) Import/Export Cargo by Countries

Concerning the amount of general cargo imported in 1990, as shown in Table 2.1.7, Australia exported about 15,000 F/T (42%), and subsequently Fiji and Japan about 10,500 F/T (29%) and 5,400 F/T (7%) respectively. Incidentally, the fact that in 1986 the imported general cargo from Japan amounted to about 12,000 F/T (36%), being regarded as large, was presumed to be caused by the construction of causeway dikes between Betio and Bairiki and the carriage costs of machines and materials. Fuel came mostly from Fiji.

About 9,000 F/T of copra, which is the major item in the 1989 exported goods, as shown in Table 2-1-6, was bound for EC (Dutch).

TABLE 2.1.7: Import Cargo by Origin

(freight tons)

	1985	1986	1987	1988	1989	1990	1991 (Jan-Mar)
[General Cargo]							
Australia	12,737	12,380	15,555	15,428	15,212	15,164	3,480
Japan	3,870	11,638	6,623	7,017	6,349	5,383	1,300
Fiji	1,655	5,935	2,751	5,118	6,088	10,479	1,856
New Zealand	1,574	2,279	2,326	-	1,046	1,464	502
Hong Kong	-	-	-	-	642	1,434	148
Nauru	14	21	1,195	-	112	250	-
Others	255	124	220	22	190	1,814	149
Subtotal	20,105	32,377	28,670	27,585	29,639	35,988	7,435
[Bulk Fuels]							
Fiji	NA	-	-	1,003	5,898	5,982	2,800
Guam	NA	NA	NA	5,743	707	-	-
Subtotal	5,091	5,295	6,331	6,746	6,605	5,982	2,800
Total	25,196	37,672	35,001	34,331	36,244	41,970	10,235

SOURCE: Kiribati Statistical Yearbook 1988 and SCK Materials

(3) Present Conditions of Containerized Cargoes

In 1984, the total number of import-cargo containers landing at Port Betis was 784 TEU, which grew to reach 1,478 TEU in 1990 -- an increase of about 115%. The reason was that in May 1989, Pacific Forum Line (PFL) started to use a small-size container vessel(loading capacity of 150 TEU), so that cargo from Fiji and New Zealand was containerized. The tonnage of containerized cargo in 1990 was about 29,000 F/T, a much larger volume than the 7,200 F/T of bulk cargoes, and the rate of containerization of import general cargoes was 80%. Furthermore, this rate reached 84% for the first quarter in 1991. The containerization of import general cargoes is rapidly advancing. In addition, it is reported that several scores of containers from Hawaii each year were unloaded at Christmas island.

Not only with import cargo transportation, but with domestic cargo transportation in Kiribati as well, they are planning to use containers mainly on the Tarawa-Christmas route.

The containerization of domestic cargo transportation is that it is very good for security of the cargo and for damage prevention; the second merit is that, at international transportation bases, the work of re-packing can be saved for domestic transportation.

Table 2.1.8 shows the present conditions of containerized cargo transportation.

TABLE 2.1.8: Containerized Transportation of Import Cargo

(freight tons)

	1984	1985	1986	1987	1988	1989	1990	1991 (Jan-Mar)
IMPORT								
General cargo	22,400	20,104	32,376	28,670	27,585	29,639	35,988	7,435
Bulk c.	8,914	5,020	17,883	9,935	8,315	7,000	7,216	1,156
Container c.	13,486	15,084	14,493	18,753	19,270	22,639	28,772	6,279
Containeri-zation (%)	60	75	45	65	70	76	80	84
Number of containers	687	784	733	982	932	1,243	1,478	348
FT/container	19.6	19.2	19.8	19.1	20.7	18.2	19.4	18.0

SOURCE: Kiribati Statistical Yearbook 1988 and SCK Materials

(4) Import/Export Cargo Transportation by SCK

The principal business of the Shipping Corporation of Kiribati is the domestic transportation in Kiriati, but they are doing some international cargo transportation to and from their neighboring countries. Nevertheless, the share of the Shipping Corporation of Kiribati in the total import/export cargo shipment done at Port Betio was only 16%, which is the figure for 1984 when they achieved their best.

Their major dealing is done in import cargoes, most of which come from Fiji; and their export cargo destinations include Tuvalu, Fiji, and the Marshall Islands. The transportation done by the Shipping Corporation of Kiribati may not be transportation between third countries; rather, we may think that Kiribati's own import/export cargo was taken aboard on the vessels of their own nationality. The Moanaraoi, owned at present by the Shipping Corporation, used to sail as a feeder service of PFL between Fiji, Tuvalu and Kiribati. We may consider that this practice had been conducted under the same principle.

The Kiribati government has an intention of increasing the share of shipment by their own vessels, so that first they can somewhat improve their invisible foreign trades and second, by eliminating the un-certainty of import cargoes carried by foreign vessels, they may prevent stagnation in their economic activities.

Table 2.1.9 shows the volume of import/export cargo transportation done by vessels of the Shipping Corporation of Kiribati.

TABLE 2.1.9: Share of SCK in Kiribati Import/Export Cargo

(freight tons)

	1984	1985	1986	1987	1988	1989	1990
Import Cargo	29,211	25,195	37,672	35,001	34,331	36,244	41,970
Foreign ship	(25,313)	(23,528)	(34,628)	(32,232)	(29,722)	(34,389)	(41,288)
SCK ship	(3,898	(1,667)	(3,044)	(2,769)	(4,609)	(1,855)	(682)
SCK share(%)	13	7	8	8	13	5	2
Export Cargo	10,458	9,008	3,838	4,755	12,158	10,013	5,848
Foreign ship	(8,176)	(7,874)	(3,540)	(4,450)	(11,522)	(9,232)	(4,908)
SCK ship	(2,282)	(1,134)	(298)	(305)	(636)	(781)	(940)
SCK share(%)	22	13	7	6	5	8	16
Total	39,669	34,203	41,510	39,756	46,489	46,257	48,996
Foreign ship	(33,489)	(31,402)	(38,168)	(36,682)	(41,244)	(43,621)	(46,196)
SCK ship	(6,180)	(2,801)	(3,342)	(3,074)	(5,245)	(2,636)	(1,622)
SCK share(%)	16	9	8	8	11	6	3

SOURCE: Kiribati Statistical Yearbook 1988 and SCK Materials

2.2 OUTLINE OF HARBOR FACILITIES

2.2.1 General Condition of Harbors

With the exception of Betio Port in Tarawa and other similar ports, the harbors of each island in the Republic of Kiribati have no facilities to bring ship alongside the wharf or pier for the ships which belong to the Shipping Corporation of Kiribati because of such problems as many afolls and shallow depth.

The present conditions of the harbors are as follows:

TABLE 2.2.1: Condition of Harbor Facilities

Name of island [Name of port or wharf]	Presence of wharf or pier	Possibility to bring ship alongside the wharf of pier for the SCK's ship
(Gilbert Islands)		
Tarawa [Betio]	YES	YES but ship's maximam draft should be less than 4.6 meters
Butaritari	YES	NO
Abemama	YES	NO
Other islands	NO	NO
(Phoenix Islands)		
Canton	YES	YES
Other islands	NO	NO
(Line Islands)		
Christmas [London]	YES	NO
Other islands	NO	NO

The harbors of both Makin and Marakei in the Gilbert Islands are in very poor condition and have no anchorage for ships. However, most of the other islands have suitable anchorage either around the island or in the lagoon, even though they have no wharf.

2.2.2 Facilities and Cargo Handling Situations in Harbors

(1) Tarawa island

As shown in the attached chart (Appendix), piers of about 44 m and 50 m in length, respectively, are provided in the northern part of the eastern breakwater in Betio port.

The depth of water in Betio Port is approximately 5.2 m at the lowest tide and the ships which belong to SCK are able to bring ships alongside the pier. The supply of fuel and fresh water, going on board/leaving a ship of passengers, and bulky cargo handling are also available at these piers.

The other ships which are carrying the imported cargo (most of them are in a container) from foreign countries have to anchor offshore, as the depth of water is not deep enough. The cargo is shifted to the barges of SCK. Then the barges are towed to the wharf in the inner part of the port by the tugboat of SCK, and the cargo is unloaded to the container yard by the 25-ton crane.

In the case of exported cargo, cargo-handling works are conducted in the opposite order.

(2) Each island in the Gilbert Islands except for Tarawa island

In all the islands of Gilbert except Tarawa Island, all cargo ships are anchored (in the case of Makin and Marakei, the ships are loose). Passengers and cargo handling are done by the work boat loaded on board. Since fixed cranes at the ground facilities are not provided in the islands, most of the work is done by human power.

On the islands with no wharves or piers, the work of cargo handling is conducted by standing the work boat on the beach.

(3) Phoenix Islands and Line Islands

In Canton island in the Phoenix Islands, although there are wharves, cranes and other equipment are not provided. Consequently, the cargo handling work is done by cargo gear on board and human power. Except

for Canton Island, the Phoenix Islands are uninhabited. Even in Canton Island, only 20-30 meteorological observers are staying and therefore, the amount of the cargo is very small.

In Christmas Island of the Line Islands, as the water depth is not enough, the ships are unable to come alongside the wharf. Notwithstanding, as in the case of Betio port, the transport of passengers and cargo handling are done with the self-propelled barges and 30-ton crane from anchored ships to the wharf. Therefore, on Christmas Island, container cargo handling is available.
The situations on Fanning Island and Washington Island in the Line Islands are similar to those on the Gilbert Islands except for Tarawa. The other islands except the 3 islands mentioned above are uninhabited.

2.3 OUTLOOK OF TRAINING OF SEAMEN

Prior to the independence of Kiribati, Kiribati Marine Training School (MTS) opened in 1967 to train seamen codes for deck engine and catering departments.

This school was founded by the Gilbert Ellice government with aid from England, the United Nations and two steamship companies (English and German). Under the new name of the Marine Training Center (MTC), the Center currently belongs to the Ministry of Trade, Industry and Labor.

The objectives of the school's foundation were, and still are, the following four items:

(1) To train ratings for employment on overseas ships. Initially employment was to be on the vessels of the two sponsoring companies. Gilbert and Ellice Island seamen were to work in the Deck, Engine and Catering Departments.

(2) To provide overseas employment for young Gilbert and Ellice Islanders enabling them to earn more money than they could at home.

(3) To increase the flow of foreign currency into the Gilbert and Ellice Islands from the remittances of the seamen working overseas.

(4) To provide income for the community as a whole from these remittances.

To Kiribati, with no attractive industry and just a few opportunities of employment, the remittances by the graduates of the Center from the places of their employment are big elements for the country's obtaining foreign currency, and greatly contribute to the national life.

The Center was originally just for training seamen. With the expansion of the training, the education course for junior officers and the fishing business course (56 students, one-year course), aided by Japan, are now established.

On the inter-island transpiration vessel Nei Mataburo, granted by Japan in 1984, accommodation equipment for 12 trainees and an instructor of the Center are provided. Replacing the scrapped former training vessel Teraaka, Nei Mataburo started to be used for on-board training. 128 trainees are in the Center at present, for training for the deck, engine or catering department. The Center is planning to conduct the on-board training in which some of the trainees are always on board the Nei Mataburo and a new cargovessel.

2.4 OUTLINE OF NEW SHIPBUILDING/REPAIRING FACILITY

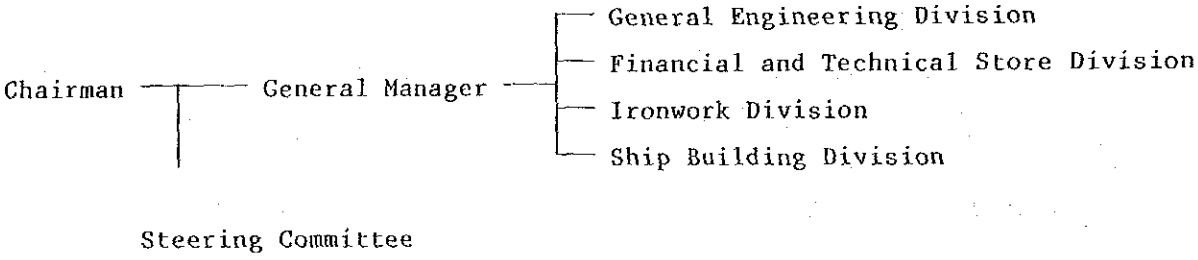
2.4.1 Betio Shipyard Ltd.

In Kiribati, wooden canoes and other similar-type vessels are built at small-scale private shipyards. Betio Shipyard Ltd. is the only shipyard possessing the slipway, building berths and other special facilities in this country.

Businesses conducted by Betio Shipyard Ltd. include building of vessels up to 100 tons, repair (steel vessels, wooden vessels), repair of aluminum vessels and repair of FRP vessels.

The main facilities and machines for repairing work are one unit of slipway to elevate vessels, electric welding machines (for steel or aluminum), machine tools, machine tools for woodworking, machines for canvas-work, machines for metal-plate work and various tools. (Refer to Appendix.)

The total number of the employees is 34. The organization diagram is as follows:



Betio Shipyard Ltd.is currently building wooden canoes ordered by the Fishing Public Corporation. The company is also conducting small-scale repair work for the ships belonged to Kiribati Shipping Public Corporation. To conduct the periodical repair for all of the ships, except for the slipway work for large-sized vessels at this shipyard from the business year of 1991, a study aiming to raise the staff's technical level and other projects are being planned.

2.4.2 Fiji Marine Shipyard

Fiji Marine Shipyard is located in Suva, Fiji. 60 years have passed since the shipyard started shipbuilding in 1930. At present, the shipyard is divided into two businesses; GSY (Government Ship Yard) and PSY (Public Slipway). GSY is mainly for steel-ship building and PSY is for repair of steel and wooden vessels.

The abilities of the building berths at GSY and the slipways at PSY are as follows:

Building Berths at GSY

Name	Length(m)	Breadth(m)	Gross Tonnage
No.1	76	1.1	1,500
No.2	61	0.9	1,000

Slipways at PSY

Elevation Rail	Length(m)	Breadth(m)	Draft(m)	Elevation Weight(t)
No.1	73	No limit	4	1,000
No.2	55	No limit	4	500
No.3	30	5.4	4	200
No.4	20	5	3	100
(No.4 is located at GSY.)				

PSY also possesses an about 55 m long wharf for repair work. Repair work which do not require a slipway are done at the wharf.
Repair work is conducted for Fijian ships as well as steel and wooden ships operating in the peripheral sea zone of the country. Main machine tools (including those owned by the Public Work Division of the Ministry of Transport) are as listed in the Appendix.

The numbers of employees of the National Shipyard are 92 in the Management Division (including Staffing and Designing), 70 in the Building Division and 78 in the Repairing Division; 240 in total. Repair work for the outfits of main and auxiliary machineries are conducted either by the employees of the shipyard or by the subcontracting factory.

Repair work including slipway work for large-sized ships over 100 tons owned by Kiribati Shipping Public Corporation have been conducted by Fiji Maine Shipyard.

2.5 OUTLINE OF PLANS RELATED TO THIS PROJECT

2.5.1 The Sixth National Development Plan 1987-1991 of Kiribati

Kiribati laid down the Sixth National Development Plan 1987-1991 in 1986. (Partially amended in 1988) The following items were laid down in the plan:

(1) Renewal of MOANARAOI.

(2) Training of students at Seamen's School for deck and engine work.

(3) Explosion of unexploded islands of Gilbert Islands and coral reeves of Line Islands (Washington island and Northern Line Islands).

(4) Improvement and dredging of London wharf in Christmas island and other facilities.

(5) Resettlement in Fanning island and Washington island (Northern Line Islands).

2.5.2 Plan for Settlement in Northern Line Islands

After the Sixth National Development Plan 1987-1991 of Kiribati was issued, the Ministry of Home Affairs and Decentralization laid down the plan for resettlement in Fanning island (Tabuaeran) and Washington island (Teraina) in the Northern Line Islands in July 1987 to disperse the concentrated population of the Gilbert Islands.

The ministry is drafting the following resettlement plan target:

Year	No. of Immigrants from Gilbert Is.	Total No. of Settlers (incl. natural increase)	Natural Increase (3%)	Total Population
1987	0	1,000	30	1,030
1988	500	1,530	46	1,576
1989	1,000	2,576	77	2,653
1990	1,000	3,653	107	3,760
1991	1,000	4,760	140	4,900
1992	1,000	5,900	174	6,074
1993	1,000	7,074	210	7,284
Total	5,500			

To promote the plan, the ministry is inviting applicants for settlement from each island. The number of applicants was 4,720 by April 1990 (including 117 applicants from Christmas Island).

The number of the settlers is 1,800 at present, although there is a small lag behind the plan. The budget for the plan is estimated to 5 million A$; consolidation of the infrastructure, establishment of school, hospital, assembly hall and deposit of copra and arrangement of vessels for transporting settlers. The aid from New Zealand is expected to be the main source of revenue. With the transportation of the immigrants and the necessities of life for the settlers, the marine traffic between Gilbert Islands and Line Islands will be rapidly increased.

2.6 CIRCUMSTANCES AND CONTENT OF REQUEST

2.6.1 Circumstances of Request

The Republic of Kiribati is an archipelago of 33 islands in the central southern Pacific. The islands are scattered in three groups straddling the Equator east and west of the International Date Line. The three groups are the Gilbert, Phoenix, and Line Islands. Almost all of the islands are formed atop coral reefs. Besides copra and small amounts of agricultural products, the only produce of the country is fish caught in the surrounding waters. Consequently, the country's economy is based on the import of foodstuffs, industrial products, etc., plus the export of copra and marine products.

Inasmuch as there are no other suitable ports in the country, all of Kiribati's imports are first carried to Betio in Tarawa (the capital), and then transported to the other islands. In addition, except for the amount exported directly, all of the country's main export copra is also first transported and collected at Betio, before it is exported.

Almost all of the country's exports and imports as well as cargo carried between the islands of the Republic are transported by sea. (A small quantity is carried as air cargo.) The hauling of almost of the country's imports and exports on international lines is done by foreign ships, whereas cargo between the domestic islands is transported by vessels belonging to Shipping Corporation of Kiribati (SCK). Problems regarding transportation are discussed below.

1) Most of the imported cargo is transported by foreign ships and only a small cargo share by ships of Kiribati registry. In 1988, only 5% of the exports and 13% of the imports were carried by Kiribati vessels. Because the amount of imports and exports is small and profit margins for foreign companies are low, transportation services run on an irregular basis. As a result, the procurement date for imports, which account for 75% of all import and export cargo, is unreliable and often affects production activity negatively.

2) The international trend, including the South Pacific, has been towards the containerized transportation of general cargo that until recently had been transported in bulk. This change is reflected in the fact that 80% of the general cargo imported by Kiribati in 1990 was transported in containers. Because no Kiribati ships are capable of containerized transportation, Kiribati's dependence on foreign ships is increasing, which in turn aggravates its economic burden.

3) The population of Kiribati is increasing at a high rate (2.3% in 1990). Commensurately with the promotion of the outer islands' development, imported freight as well as interisland cargo haulage is increasing yearly.

Also, as part of the National Development Plan for diffusing the population concentration from the Gilbert Islands, a resettlement project from the Gilberts to the northern Line Islands (Washington and Fanning Islands) that was started in 1988 is under way. For this it is necessary to transport the settlers' household goods, etc. and their families. After they set up housekeeping, it will also be required to transport passengers, necessities, materials and machinery for development, etc. on a regular basis.

As a result the transportation demand between the Gilbert and Line Islands is expected to increase, and the need to provide transportation on a regular basis will rise. Although there exists an air service to transport passengers from Hawaii to Christmas Island (one of the Line Islands), passengers to and from the Gilbert Islands can only be transported by ship. Kiribati, therefore, must rely heavily upon marine transportation.

SCK performs the above transportation services mainly with the help of the "Moanaraoi" and two other 500-ton passenger-cargo ships (one of which was constructed by Japanese grant aid in 1984). The "Moanaraoi," however, which was built in 1958, is a superannuated vessel that has been in service for more than 33 years. Every year it requires longer layups for repairs. This exerts a negative effect on SCK profits. In addition to the transportation of passengers and cargo between the domestic islands, the vessel until 1988 was also used to transport some of the country's exports and imports. In October of the same year, however, the vessel because of its deteriorating condition lost its license for sailing in international waters.

To offset the decline in transportation capacity, the government of Kiribati as part of the National Development Plan, decided in 1987 to replace the "Moanaraoi" with a new multipurpose cargo vessel, which in addition to having similar transportation capabilities, would also be equipped to transport cargo both in bulk as well as in containers. By doing so the government also hoped to raise the cargo share of the country's imports carried by its own ships, which in turn would stabilize the supply of imported cargo. It is against this background that the Kiribati government has requested Japanese government grant aid that would

be used to build the new vessel.

2.6.2 Content of Request

The requested vessel will be used for inter-island cargo-passenger transportation in Kiribati as well as for cargo shipping in the international navigation by acquiring the international ship class. This multipurpose cargo vessel can carry either bulk cargo or containers (20 feet containers). The outline specifications of the vessel are as follows:

(1) PRINCIPAL DIMENSIONS

Length overall	Approx. 68.90 m
Length between perpendiculars	63.00 m
Breadth molded	11.80 m
Depth molded	5.90 m
Designed Draft molded	4.20 m
Gross Tonnage	Approx. 1,200 tons

(2) PRINCIPAL CAPACITIES

Deadweight	1,000 tons
Cargo Holds (Grains)	Approx. 2,220
Container Stowage (in hold)	Approx. 26 TEU
(on deck)	Approx. 15 TEU
Total	Approx. 41 TEU (including 6 reefer containers)
Service Speed (full load)	Approx. 10.0 knots
Endurance	Approx. 5,000 nautical miles at service speed of 10.0 knots

(3) COMPLEMENT

Crew members (Officers)	6 persons
(Ratings)	7 persons
Total	13 persons

Passengers	(Deck)	50 persons
	(Saloon)	6 persons
	Total	56 persons
Seamen Cadets		16 persons
Instructor		1 person
	Total	17 persons
Total		86 persons

(4) OTHER REMARKS

Classification	Nippon Kaiji Kyokai (NK)
	NS*, MNS*

One set of empty containers (stowage of new cargo vessel) shall be provided.

Spare parts for 2 normal service years shall be provided.

CHAPTER 3 OUTLINE OF THE PROJECT

CHAPTER 3 OUTLINE OF THE PROJECT

3.1 OBJECTIVE

As stated in the preceding section, to improve the situation, building of a multipurpose cargo vessel being able to carry either bulk cargos and/or containerized cargos, conduct the inter-island cargo-passenger transportation carrying passengers and conduct the imported-cargo transportation replacing MOANARAOI is the objective of this project.

3.2 STUDY AND EXAMINATION ON THE REQUEST

3.2.1 Study of the Propriety and Necessity of the Project

Kiribati is located in the central South Pacific. The country imports foodstuffs, fuel, and other materials from Australia and Fiji, and machinery and other material from Japan. It exports copra, etc. to Europe, and fishery products to Fiji. For these reasons, Kiribati relies heavily on international transportation. In addition, the carriage of cargo and passengers between Tarawa (the center of the country's imports and exports) and the outer islands (which cover an area approximately 3900 km east and west and 2000 km north and south of Tarawa) is indispensable for the well-being of the Kiribati people. Furthermore, as a result of the rising population and progress in development, the need for the transportation of passengers and cargo is constantly expanding.

Among SCK's vessels, however, the condition of the "Moanaraoi," which has been in service for 33 years, is deteriorating and requires ever longer layups for repairs. Because the ship is then out of operation, a decline of transportation capabilities has set in. Moreover, the rise in repair costs as well as the greater length of the time the vessel is laid up have had an adverse effect on the company's profits. Thus, the acquisition of a multipurpose vessel with capabilities similar to the "Moanaraoi"--one that can cope with the progress of development in the far reaches of the country as well as with the demands of containerization in international transportation--is of the utmost importance not only for SCK, but also politically for the government of Kiribati.

3) The new vessel will increase the transportation capacity of SCK, and this in turn will enable the company to implement regular services for the carriage of passengers and cargo between the islands, and thus contribute to the invigoration of economic activity.

4) The new vessel can also be used for the on board training of seamen cadets studying at the Marine Training Center. The vessel would help them to acquire greater skills, and make it possible for the graduated seamen cadets to have more opportunities to work on foreign ships in the future, where they can earn foreign exchange.

In light of the above, the project under consideration was found to be in conformity with the National Development Plans of the Republic of Kiribati and was deemed necessary for the constant growth of the economic life of the people. It was concluded that the project would be of benefit to the population at large and its implementation on the basis of grant aid was considered to be a sound decision.

3.2.2 Study of the Implementation and Operation Plans

Although the Ministry of Transport and Communications will be responsible for working out financial measures to assure the the proper use and maintenance of the vessel, the vessel's operation and management will be conducted by SCK. The following is an assessment of the operational and management capabilities of SCK, on the basis of its past performance. This shows that the company is fully capable of utilizing the new multipurpose cargo vessel in a profitable way, which would be of benefit to the regional economy.

1) The company possesses sufficient manpower and the expertise necessary for operating and managing the new vessel.

2) The ship "Nei Mataburo," which was granted to Kiribati by the Japanese government, has been utilized, maintained and managed in a satisfactory way.

3) Although there was a year when SCK was in the red, it has been able to show a small profit when its aggregate income over a number of years is considered. SCK's financial status should therefore pose no problems.

4) For the sake of public well-being, the company's unprofitable transportation services to the outer islands are subsidized by the government.

5) As a result of government projects for the resettlement and development of the islands, transportation demand is expected to continue to grow.

Below is a detailed discussion of the above points.

(1) Administrative personnel and crew

1) Administrative personnel

SCK considers the new multipurpose cargo vessel to be a replacement for the "Moanaraoi." Management of the vessel would be performed under the company's existing organization and should be no problem.

2) Crew

The company plans to transfer the whole crew from the "Moanaraoi" to the new vessel as soon as it is completed. (On the completion of the new vessel, "Moanaraoi" will be scrapped.) The necessary number of officers and ratings is given below.

a. Officers

The number of officers required to staff the new vessel plus the qualifications they will need under Kiribati law are given in 3.3.1. These are based on Kiribati's Shipping Bill 1990 (details based on the South Pacific Maritime Code). The Bill requires that a total of six officers be on board--three on deck and three in the engineering department. The number of

qualified personnel ashore and on the Moanaraoi who can be transferred to the new vessel are shown in Table 3.2.1. These satisfy the number of personnel that will be required and should therefore present no difficulty.

TABLE 3.2.1 Comparison between the Number of certified Officers needed by Law to be on board the New vessel and the Number of qualified Officers within SCK

Deck Department		
To be stationed aboard the new vessel	Minimum number of certified personnel as required by law	Number of qualified personnel working on shore for SCK (including those aboard the "Moanaraoi")
Captain	G3 (master) x 1	G1 x 4 (2)
Chief officer	G3 (mate) x 1	G2 x 3
Second officer	G4 (mate) x 1	G4 x 1
Engineering Department		
To be stationed aboard the new vessel	Minimum number of certified personnel as required by law	Number of qualified personnel working on shore for SCK (including those aboard the "Moanaraoi")
Chief engineer	EG2 x 1	EG2 x 1
Second engineer	EG3 x 1	EG3 x 4 (1)
Duty officer	EG3 x 1	

Note: ( ) denotes personnel now working on "Moanaraoi."

b. Ratings

The number of ratings, six in all, that must man the new vessel, is also in accordance with the Kiribati Shipping Bill discussed above. The number of ratings required to be on board the new vessel is seven. SCK is planning to transfer the required number from the crew of the "Moanaraoi" (24 people) and no difficulties are foreseen in this regard.

Moreover, because the Marine Training Centre (MTC) on Tarawa is training and graduating about 100 seamen each year,

there should be a sufficient number of applicants who can do the job.

c. Seamen cadet

The "Nei Mataburo," provided by Japan in 1984, is equipped with facilities for 12 seamen cadets and one instructor and has become an important part of the Centre's onboard training program. It has been requested that the new ship also be equipped with facilities for 16 cadet seamen and one instructor. It has been concluded that this would not only assure the availability of a sufficient number of qualified personnel in the future, but would also increase the opportunity for cadets to receive onboard training, which at present only the "Nei Mataburo" can provide.

(2) The financial status of SCK

The Shipping Corporation of Kiribati is 100 percent government-financed corporation, and operates on a self-supporting accounting basis. Figures for operating income and expenses for the years between 1984 and 1988 are given in Table 3.2.2. As can be seen, during the five-year period, only 1987 shows a negative balance.

Operating profits are affected by the amount of cargo handled each year as well as by the amount of copra transported, which tends to increase and decrease yearly, depending on the amount produced. Profits are also affected by rises in operating expenses, particularly by the yearly increase in personnel salaries.

Moreover, because of the amount equivalent to the capital cost of a vessel, even though grant aid is at first repaid and only returned later in the form of a special account, it is more practical to judge the company's financial status on the basis of pretax profits rather than on business losses for the year. The ratio between pretax profits and the company's operating income for the five-year period is 4 percent, indicating a profit, although a small one in monetary terms.

Partly because of the damage to the "Moanaraoi" and also from the fact that the vessel was under repairs and laid up for four months, the figures for 1989 are expected to show the company to be in the red.

Furthermore, the yearly repair cost for the ships, which amounted to A$420,000 (14 per cent of total operating costs) in 1984, is rising each year and stood at A$1,100,000 (28 per cent of operating costs) in 1988, of which the repair cost for the Moanaraoi accounted for A$575,000 Repairs have thus become an important factor in profit suppression. The replacement of the "Moanaraoi" with a new cargo vessel is expected to result in increased operating profits, as shown in Table 3.3.2. This is because maintenance costs for the new vessel would be much lower.

TABLE 3.2.2 Trends in SCK's Income and Expenditures

unit: 1000 Australian dollars

Items \ Year	1984	1985	1986	1987	1988
Operating profits	3,355.1	3,310.1	3,688.3	3,308.8	4,082.2
Operating expenses	3,934.0	3,472.0	3,559.4	3,684.6	3,938.0
(Breakdown)					
Employee salaries	889.6	969.4	1,095.8	1,334.7	1,497.3
Welfare expenses	215.0	290.0	197.1	318.8	342.8
Vessel repair costs	419.6	723.6	773.3	841.4	1,099.7
Fuel and lubricating oil	419.2	518.6	597.4	495.5	374.0
Vessel depreciation expenses	381.2	484.9	526.8	449.4	347.8
Interest on capital borrowed for vessel purchase	135.8	93.5	53.0	48.7	31.0
Insurance	137.7	291.2	165.0	126.2	139.8
Utility expenses	55.5	44.3	48.1	39.5	46.9
Other expenses	176.3	43.9	77.2	69.5	63.2
Reserve funds to cover minor claims	103.4	12.7	24.9	(39.1)	(47)
Current account (loss) and gain	421.0	(152.4)	128.0	(375.8)	144.2
Previous year adjustment funds	–	(174.1)	83.0	–	(29.0)
Money transferred from valuation of assets (Note)	51.4	123.3	123.3	123.3	123.3
Profit and loss on sale of fixed property	–	74.7	–	(60.0)	118.8
Special items	–	6.4	4.6	19.3	(33.8)
Pretax profits	472.4	(122.0)	339.8	(293.2)	317.6
(Reference material) Pretax profits, in case adjustment funds for previous year have been included in accounts of previous year	298.3	135.1	256.8	(322.2)	346.6

SOURCE: SCK Materials

Note: "Transfer balance from 'valuation of assets'" is a supplementary item meant to offset the amount equivalent to the capital cost of the "Nei Mataburo," the vessel presented by grant aid by Japan and counted under "vessel depreciation expenses."

(3) Container management

The Shipping Corporation of Kiribati requests the supply of one set of containers to be delivered aboard the multipurpose cargo vessel. SCK plans on completion of the vessel to track the locations of the containers and their condition by introducing a computer system. SCK is also planning to appropriate funds for maintenance, spare parts, and repair of the containers, as well as a budget for the computer system. Because the number of containers to be supplied is small, no difficulty is foreseen in their management.

3.2.3 Study of the Relationship, Possibility of Overlapping, and other Factors regarding Similar Projects or those based on Foreign Aid from other Countries

The project for the resettlement of the Line Islands mentioned in 2.5.2 is a development project related to this one.

The project is dependent upon capital assistance from New Zealand. Because of delays, however, in the construction of the infrastructure in the areas to be settled, the project is slightly behind schedule. This, in turn, is expected to result in a postponement of assistance funds. Consequently, the increase in demand for the transportation of passengers and cargo will probably not be as high as first expected. To date, however, 25 percent of the people originally targeted have already been settled. They will have to be supplied with daily commodities, construction material, etc. on a continuous basis. This would also constitute an important incentive for future applicants. The implementation of the project for the construction of the new cargo vessel, which would also service this sea route, is extremely important for the future of this resettlement project. It would also be helpful in stabilizing living conditions for those who have already resettled.

3.2.4 Study of the Substance of the Request and Other Data regarding the New Vessel

The request was studied in the following manner.

(1) The routes and requisite qualifications of the new vessel

The Kiribati government plans to use the new vessel to transport passengers and cargo between the outer islands, including the Line and Phoenix Islands. In addition, to be able to transport the daily commodities necessary for the country, the government also plans to operate the vessel on the route to Fiji and other international destinations.

Kiribati is obliged to be dependent for the supply of a large part of its daily necessities on imports, but does not have the ships necessary for their transportation and must rely on foreign shipping. Moreover, at a time when containerization is becoming increasingly popular, the country has no ships that can transport cargo in containers, and it is therefore more difficult for the country to guarantee a steady supply of necessities for the life of its people. Thus it means a great deal for the country to occasionally sail a multi purpose passenger-cargo vessel capable of containerized transportation to Fiji and other international ports for the purpose of stabilizing supply of necessities.

One of the Line Island ports where the resettlement project is promoted, however, is capable of handling containers. Thus, by dispatching the new vessel to these sea routes, cargo-handling time could be saved and it is expected that it would result in a general improvement in transportation operations.

Judging from sea routes for the new vessel mentioned above, it will not only require certifications for domestic service, but will also be necessary for international certifications such as those regarding the convention on safety of life at sea, the international load line convention, international tonnage measurement convention, etc.

Because, however, the vessel is to carry deck passengers only when it is sailing between domestic islands, it is considered appropriate that it seek international certification only for the transport of cargo.

(2) Cargo capacity, etc.

In a generalized way the cargo aboard a multipurpose cargo vessel can be divided into two large groups: cargo carried in bulk and cargo carried in containers. The bulk cargo will be examined in terms of the cargo volume of domestic transportation, the containerized cargo of the cargo volume of international transportation.

1) Topics considered

The cargo volume to be transported and its changes in accordance with the routes concerned are as follow.

i. Routes between domestic islands
Tarawa to outer islands (Cargo loading at Port Betio): transport of general cargo

ii. Routes between domestic islands
Outer islands to Tarawa (Cargo unloading at Port Betio): transport of copra, etc.

iii. International sea routes
Tarawa to Fiji (Cargo loading at Port Betio): transport of copra, etc. for export

iv. International sea routes
Fiji to Tarawa (Cargo unloading at Port Betio): transport of imported general cargo

a. Routes between domestic islands

A comparison of the amount of cargo loaded and unloaded at

Betio as shown in Table 2.1.4 in Chapter 2 gives the following.

i) Yearly average amount of cargo (1984-90): I with 6,635 F/T is greater than II with 6,010 JF/T. I shows a little fluctuation while II shows a large fluctuation

ii) Yearly fluctuation in the amount of cargo
   i. small fluctuation
   ii. large fluctuation

According to the above condition, we estimate the amount of cargo of the domestic transportation expected in the future by the above Case i. and examine the cargo carrying bale capacity of the new vessel in the following paragraph.

b. International sea routes

A comparison between the amount of export and the amount of general cargo imported, as given in Chapter 2's Table 2.1.6, shows the following.

i) Yearly average amount of cargo (1984-1990): IV with 28,109 F/T is greater than III with 8,179 F/T. IV shows a little fluctuation while III shows a large fluctuation.
   every year.

ii) Yearly fluctuation in the amount of cargo
   iii. large fluctuation
   iv. small fluctuation

According to the above condition, we estimate the amount of international cargo expected in the future by the above Case iv. and examine the cargo carrying capacity (number of containers) of the new vessel in the following paragraph.

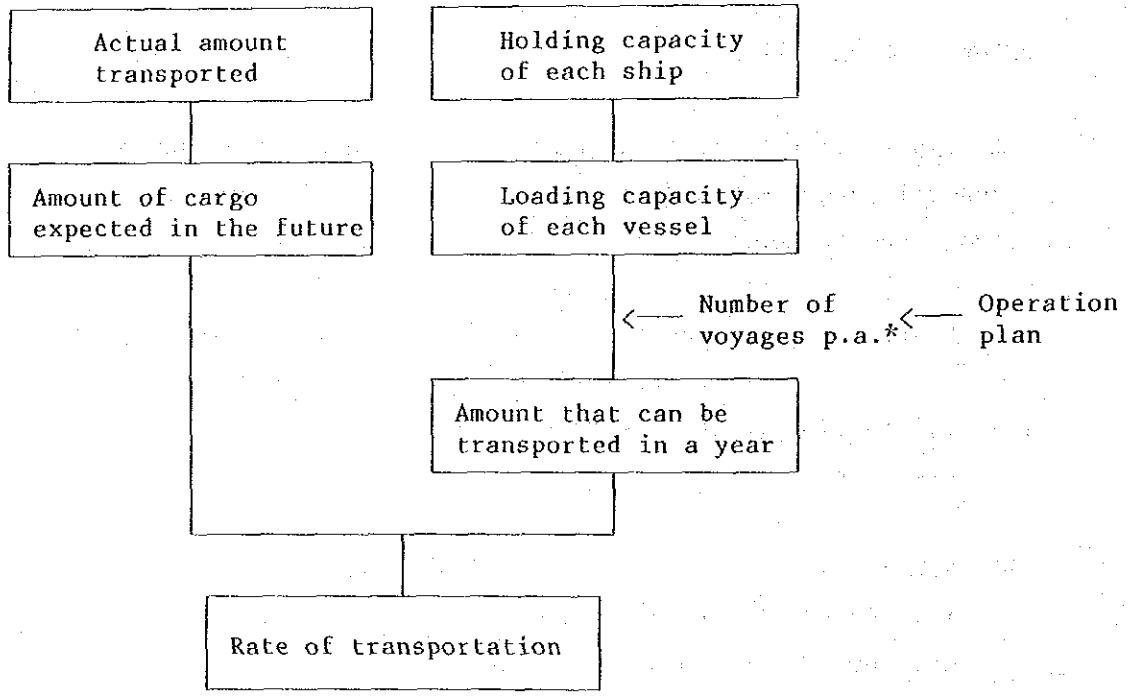
2) Calculations regarding amount of cargo and carrying capacity

a. Investigation procedure

i) Interisland domestic transport of cargo

As will be discussed in Chapter 3.3.2, the transport of cargo between the islands is mainly done by the three ships belonging to SCK. Inasmuch as the carrying capacity of the ships differs, in our calculation we have used the total capacity of the three vessels. The following procedure was used.

Transport of domestic interisland cargo

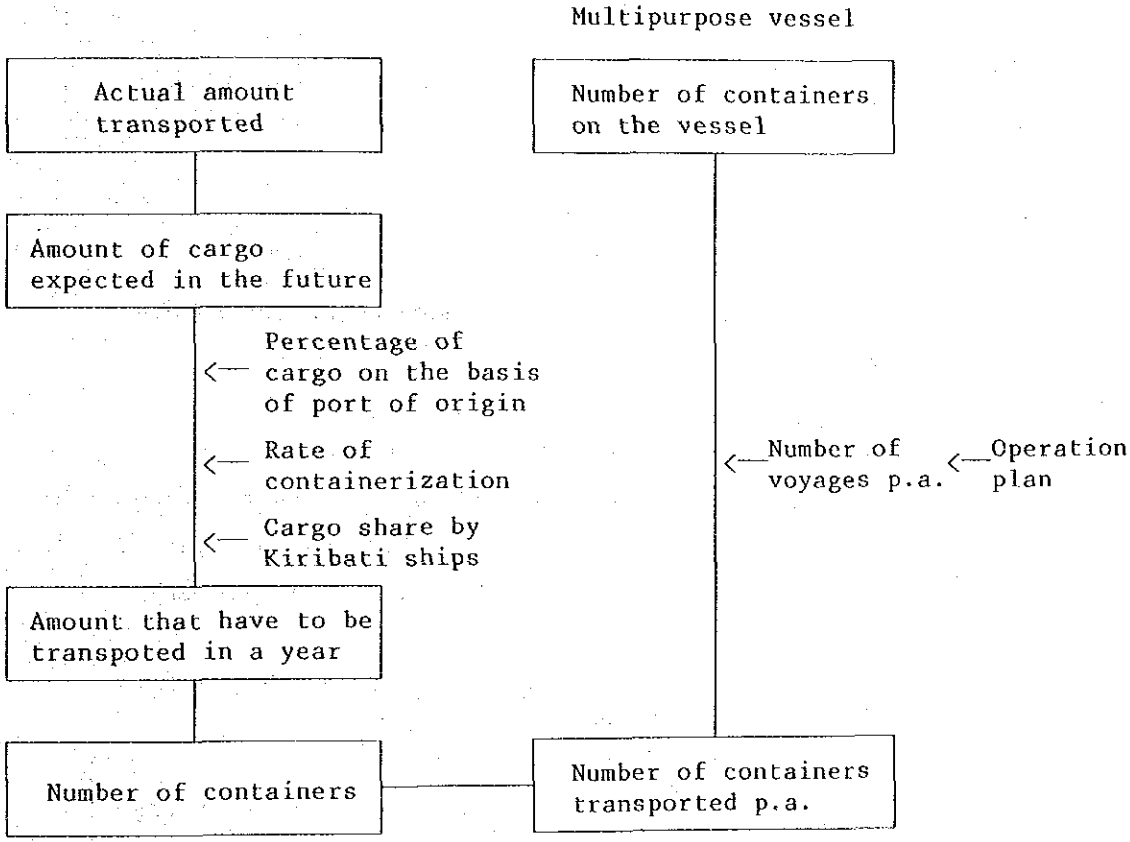


* p.a. = per annum.

ii) Transportation of international cargo

In imports calculations were adopted cargo to be coming from Fiji. The following procedure was used.

Transportation of international cargo



b. Number of annual voyages

As will be mentioned under the item, "operation plans" (3.3.2 [2]), SCK has worked out a plan for the yearly operation of its main vessels (multipurpose cargo vessels "Nei Momi" and "Nei Mataburo") after this project has been completed. The plan is shown in Table 3.2.3.

TABLE 3.2.3 Number of Annual Voyages to be made by each Ship

	Multipurpose vessel	Nei Momi	Nei Mataburo
Gilberts route	4	23	23
Line-Phoenix route	8	—	—
Fiji route	2	—	—
Total	14	23	23

3) Interisland cargo transportation

a. Actual transport record and estimated amount of future transport

The amount of cargo loaded at Betio and transported interisland between 1979 and 1990, as well as the three-year moving average, is shown in Table 3.2.4 and in Figure 3.2.1. The amount of cargo in 1995 is forecast as 10,700 F/T.

TABLE 3.2.4 Actual transport record of cargo loaded at Betio and bound for the outer islands

year	Cargo loaded at Betio and interisland bound (F/T)	3-year moving average
1979	6,900	
1980	7,146	6,904
1981	6,667	6,289
1982	5,054	5,422
1983	4,545	5,010
1984	5,433	5,307
1985	5,943	5,696
1986	5,713	6,028
1987	6,428	6,852
1988	8,415	7,408
1989	7,380	7,643
1990	7,134	
(Jan.-March 1991)	(2,446)	

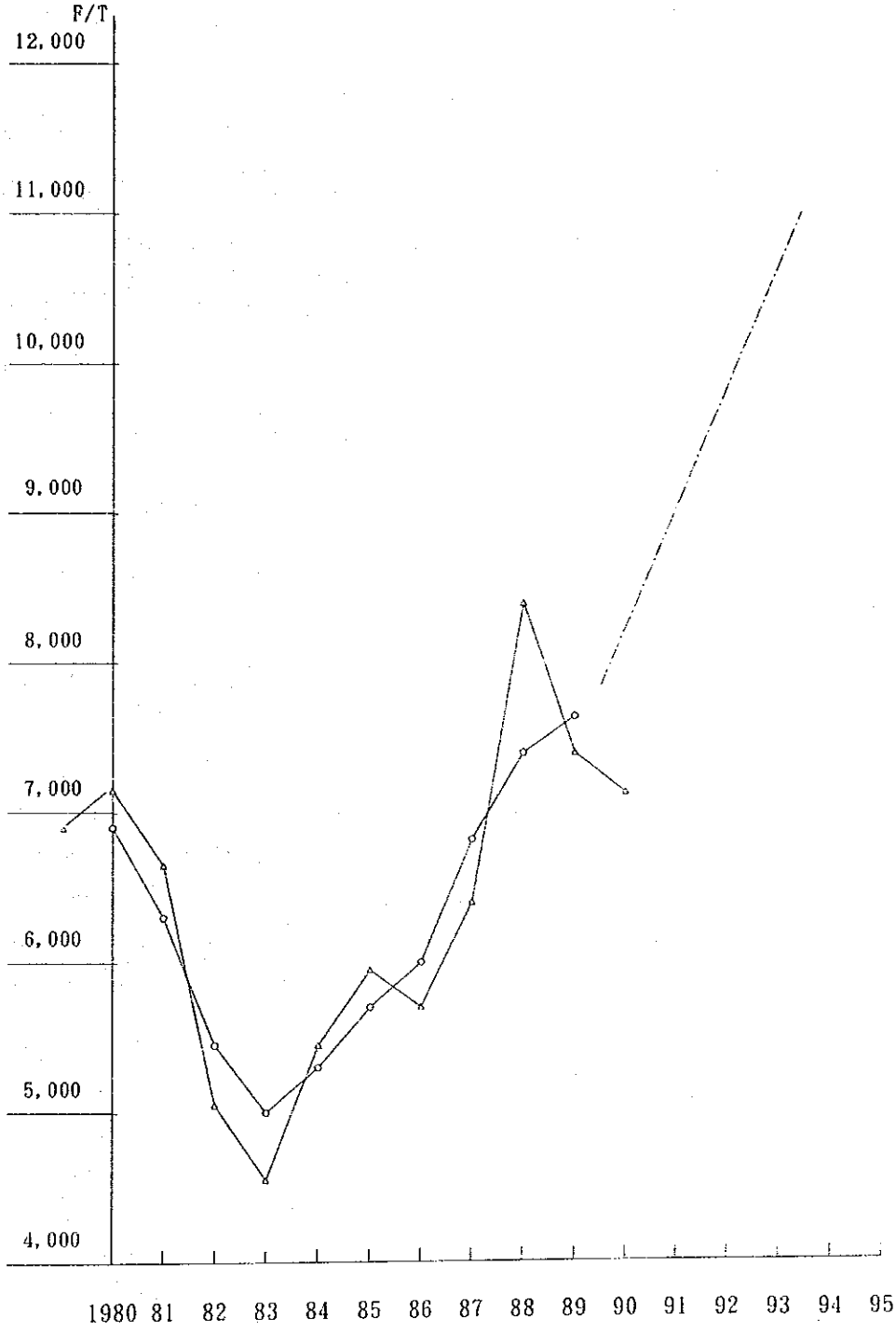
Source: Kiribati Yearly Statistics 1988 and SCK Data

Figure 3.2.1 Actual Cargo Record Transported to Outer Islands from Betio

(△): Amount Transported from Betio

(○): Three-year Moving Average

Unit: freight tons



b. Transportation rate

If we consider the bale capacity of the multipurpose cargo vessel to be 1,800 (M3) (1590 F/T), and that of the "Nei Momi" and "Nei Mataburo" 390 M3 (345 F/T) each, and calculate the rate of transportation, the result will be as shown in Table 3.2.5.

TABLE 3.2.5 Transport Rate

	A bale capacity F/T	B load rate (Note)	C number of voyages per year	D (A x B x C) amount of transport p.a. F/T	E estimated amount of cargo F/T	F = E/D transport rate %
Multipurpose cargo vessel	1,590	0.6	12	11,448	10,700	51%
NEI MOMI	345	0.6	23	4,761		
NEI MATABURO	345	0.6	23	4,761		
Total	2,280		58	20,970		

Note : The load rate per bale is set at 60% (the submersion rate of the compartment)

The rate of transportation for "Moanaraoi" and the other two vessels in 1989 is shown in 3.2.6. Although there has been little increase in the rate of transport mentioned above in comparison with Table 3.2.6, there is expected to be a gradual increase in the future as the development of the Line Islands continues.

TABLE 3.2.6 Transport Rate (1989)

	A bale capacity (F/T)	B load rate	C number of voyages	D (A x B x C) amount of transport p.a. (F/T)	E actual transport record (F/T)	F = E/D transport rate (%)
MOANARAOI	1,150	0.6	8	5,520	7,380	48%
NEI MOMI	345	0.6	20	4,140		
NEI MATABURO	345	0.6	28	5,796		
Total	1,840	—	56	15,456		

4) Transport of cargo on international routes

a. Actual transport record and forecast of the amount of cargo in the future

The amount of imported general cargo unloaded at Betio from 1979 to 1990 and its three-year moving average are shown in Table 3.2.7 and Figure 3.2.2. The amount of such cargo for 1995 is expected to be about 41,600 F/T.

TABLE 3.2.7 Actual Transport Record of Imported General Cargo

(unloaded at Betio)

year	imported general cargo (F/T)	3-year moving average (A)	year containerized cargo (F/T)	3-year moving average (B)	rate of container-ization (B/A)%
1979	26,840		NA	–	
1980	28,632	26,428	NA	–	
1981	23,812	25,931	NA	–	
1982	25,349	24,104	NA	–	
1983	23,151	23,633	11,562	–	
1984	22,400	21,885	13,486	13,377	61
1985	20,104	24,960	15,084	14,354	57
1986	32,376	27,050	14,493	16,104	59
1987	28,670	29,543	18,735	17,499	59
1988	27,585	28,631	19,270	20,215	70
1989	29,639	(31,071)	22,639	(23,560)	76
1990	35,988		28,772		80
(Jan.-Mar.1991)	(7,435)		(6,279)		(84)

Source: Kiribati Statistics 1988 and SCK Data

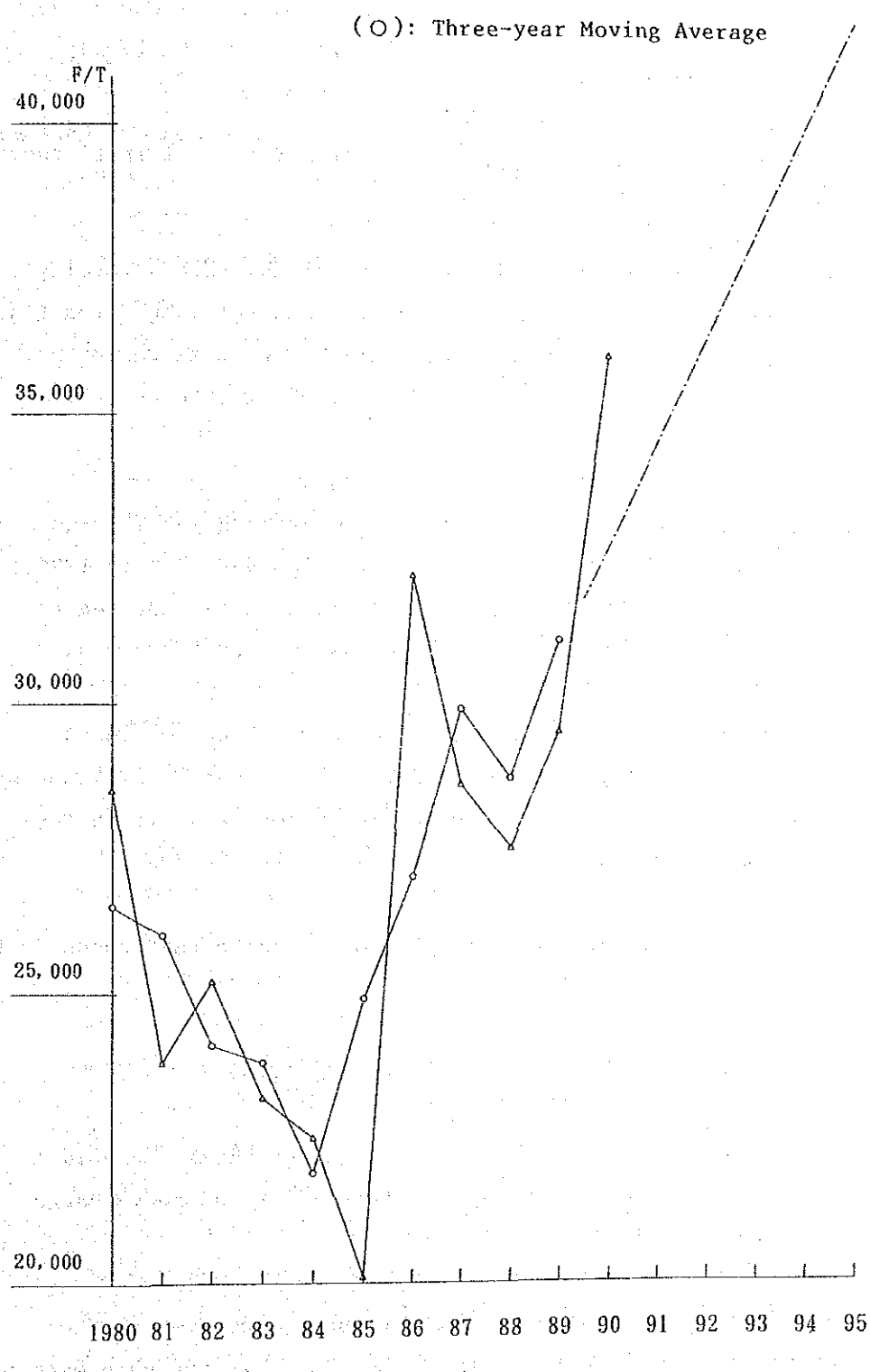
Figure 3.2.2 Imported General Cargo Transported

(Unloaded at Port Betio)

Unit: freight tons

(△): Actual amount

(○): Three-year Moving Average



b. Amount of cargo that must be transported in containers

To forecast the amount of future cargo that will have to be transported by Kiribati ships (number of containers), the following calculation was used.

$$\text{amount needing carriage origin} = \text{estimated cargo volume} \times \frac{\text{(i) amount divided on the basis of port of origin}}{\text{Total amount of cargo}} \times \text{(ii) containerization rate} \times \text{(iii) cargo share of Kiribati vessels}$$

(i) If Fiji is considered the port of origin, then according to Table 2.1.7, the amount of imported general cargo from Fiji would constitute 18.8% of all imported general cargo in 1988, 20.5% in 1989, and 28.8% in 1990. The three-year average would be 22%.

(ii) The rate of containerization for imported general cargo as shown in Table 3.2.7 above, was 70% in 1988, 76% in 1989, and 80% in 1990. Because containerization is expected to continue in the future the rate was set at 85%.

(iii) The rate of exported and imported cargo taken on board Kiribati ships, as shown in Table 2.1.9, was 5%-22%. Because the Kiribati government has an intention to increase the cargo share, the rate here is assumed at 15%-20%.

On the basis of the above, the amount of cargo that needs to be transported was determined to be:

41,600 F/T x 22% x 85% x (15%-20%) = 1,166 - 1,555

Because as is shown in Table 2.1.8 one container can hold 19 F/T, 62-82 TEU would be required yearly for the above cargo volume of 1,128-1,503 F/T.

According to the contents of the request, the number of containers on board is to be 41 TEU. Thus, if the ship were to make two voyages to Fiji a year:

41TEU x 2 = 82 TEU

On the basis of the above it can be concluded that 41TEU is an appropriate number for the new vessel.

(3) Passenger capacity

SCK has requested that the new vessel be fitted with passenger quarters for six people and be capable to accommodate 50 deck passengers. The "Nei Mataburo" granted to Kiribati by Japan in 1984, had cabin facilities for six people and accommodations for thirty on deck. As will be seen in the 3.3.2 Plan of Operation, the Shipping Corporation intends to sail the multipurpose passenger-cargo vessel on the Line Islands route, which will comprise more than half of its annual services. This is because of the estimate that in accordance with the promotion of the resettlement scheme to the Line Islands, the demand will rise for passenger transportation between the Gilberts and the Lines.

As for the Nei Mataburo, it has been renovated to accommodate 30 deck passengers and it is planned to position the ship on the Line Islands route. Because the estimated demand for passenger transportation is increasing beyond former expectations, and because the provision of facilities for deck passengers engenders no substantive design problem, the projected number of passengers to be accommodated aboard the multipurpose passenger-cargo vessel is considered to be appropriate.

A record of the number of passengers transported by vessels belonging to SCK, based on the Kiribati Yearly Statistics and SCK data, is given in 3.2.8. Figure 3.2.3 shows the same represented in the form of a graph.

The number of passengers transported by sea had been on the decline between the years 1979 and 1984 but there has been an increase since 1984.

As shown in Table 2.1.2 in Chapter 2, the number of passengers transported by sea between the domestic outer islands accounts for 25 percent of the total number of air and sea travelers. The transport of passengers by air is limited to the Gilbert Islands. The number of passengers carried by ships amounts to 85 percent of all passenger

transit (Table 2.1.3). 25% x (1 - 0.85) = 3.8% of passengers transported between the outer islands are carried solely by ships and 96% are carried by airplanes and ships. Although the number of travelers is expected to increase as a result of the resettlement of the Line Islands and the general development of the area, Tungal Air is negotiating to extend the route between Hawaii and the Christmas Islands, and to introduce flights to Fiji via Tarawa. Consequently, the transport of passengers by sea is expected to continue lagging behind transportation by air. Moreover, 75 percent of passenger transportation is more or less done by air. The request regarding passenger capacity has little effect on the basic design of the vessel. Therefore, we limited our investigations to questions regarding the request for facilities for passengers.

TABLE 3.2.8 Passengers transported between the Islands by Sea

unit: person

Year	Embarkation at Betio	Disembar-kation at Betio	Passengers embarkation/ disembarkation between the islands	Total	3-year moving average
1979	7,786	7,764	1,752	17,302	
1980	4,896	4,655	1,509	11,060	12,169
1981	4,244	3,588	313	8,145	8,984
1982	3,779	3,755	213	7,747	7,855
1983	2,275	4,856	542	7,673	6,968
1984	2,550	2,282	653	5,485	6,893
1985	3,300	2,982	1,241	7,523	6,668
1986	3,445	2,902	650	6,997	7,768
1987	4,286	3,910	498	8,785	8,214
1988	4,395	3,969	439	8,861	9,029
1989	4,237	3,978	1,227	9,442	(9,374)
1990	4,589	4,078	1,152	9,819	
(Jan.- Mar.1991)	(1,782)	(2,262)	(676)	(7,720)	

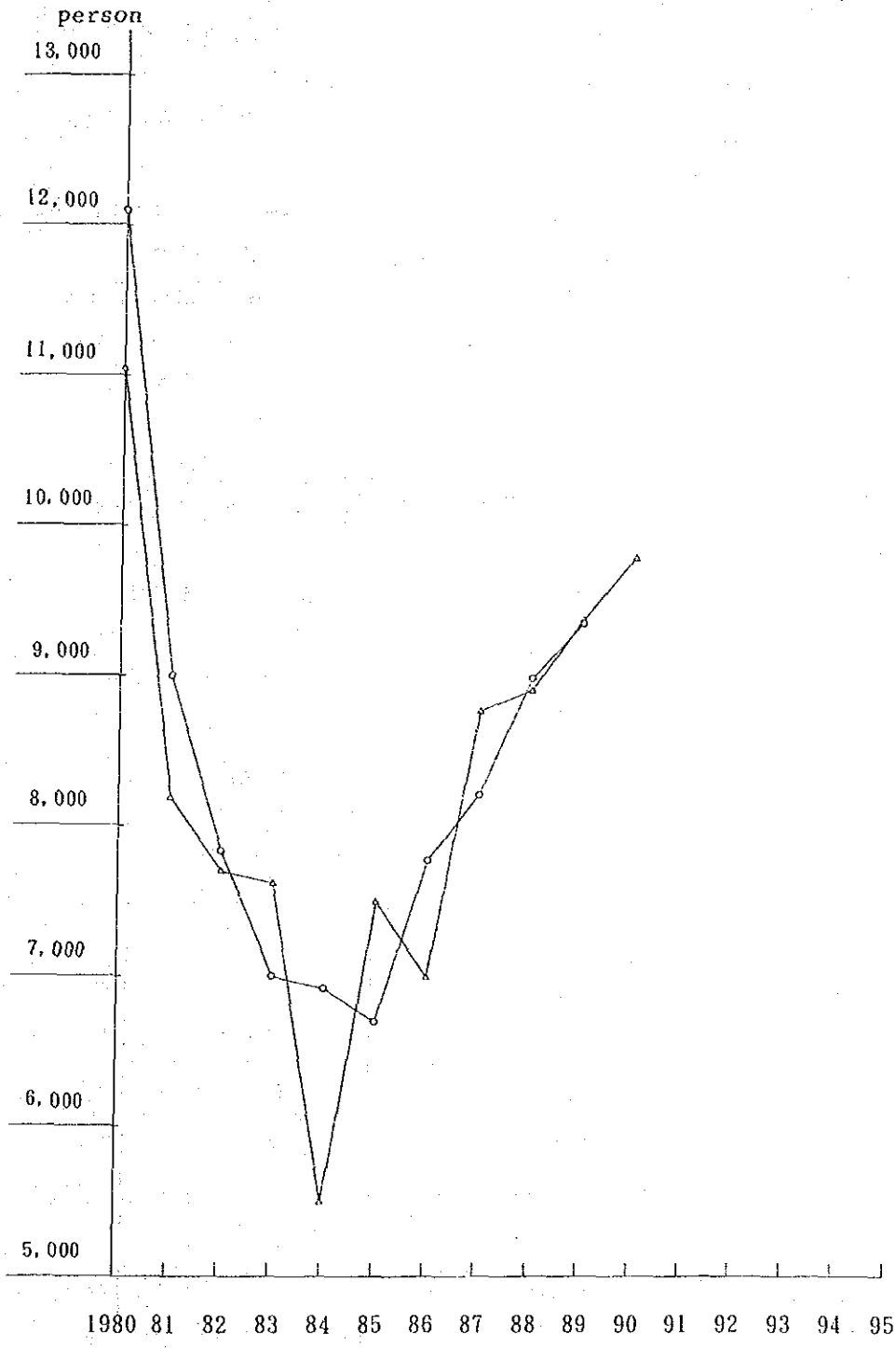
Source: Kiribati Yearly Statistics, 1988 and SCK Statistics

Figure 3.2.3 Passengers Transported Interisland by Sea
(Passengers Embarking/Disembarking)
at Betio and the Outer Islands)

(△): Passengers

(○): Three-year Moving Average

Unit: person



(4) Complement and seamen cadet

1) Size of complement

As mentioned in 3.2.2, the number of the new multipurpose cargo vessel's officers and ratings shall be determined by The Shipping Bill 1990 (to which the South Pacific Maritime Code enacted by the South Pacific Bureau for Economic Cooperation shall be applied correspondingly). Considering the legal number of officers to be three each for the deck and engine departments, or six in total; the number of ratings six or more; and that the similar type of container/bulk cargo vessel mentioned in 3.2.9 has seven ratings, the stated complement for this multipurpose cargo vessel should be reasonable. Comparisons between the multipurpose cargo vessel and the similar container bulk cargo vessel are indicated in the following Table.

TABLE 3.2.9 Comparisons between the Multipurpose Cargo Vessel and the Similar Type of Container Bulk Cargo Vessel

Item	Multipurpose Cargo-Passenger Vessel	Cargo Vessel (example)
Construction Date	————	March 1984
Nationality	Kiribati	Paraguay
Cross Tonnage	1,300 t	2,281 t
Length	63.0 m	82.0 m
Breadth	11.8 m	13.4 m
Depth	5.9 m	6.3 m
Deadweight	about 1,000 t	2,999 t
Container Stowage	36 TEU	48 TEU
Derrick Capacity	25 t x 2	20 t x 3
Main Engine's Horsepower	1,100PS x 1	3,000PS x 1
Speed	10 knots	14.3 knots
Number of Generators	3	3
Number of Complement	Officers 6 Crew 7	Officers 7 Crew 7

2) Number of Seamen Cadet

The Shipping Corporation of Kiribati requires sufficient accommodations for 16 seamen cadets and one instructor of the Marine Training Center aboard the new multipurpose cargo vessel. Concerning this matter, as mentioned in 2.4 and 3.2.2, the Nei Mataburo is actually configured for 12 seamen cadets. There would be no significant problem for meeting this requirement. Moreover, with these facilities, the seamen cadets would be able to serve as assistants for the crew.

(5) Speed

As indicated in Table 3.3.1, the Shipping Corporation of Kiribati has a plan for the service of the new multipurpose cargo vessel as follows. The vessel would navigate between Tarawa and the Line/Phoenix Islands in 26 days; it would also navigate in 20 days both through the Southern, North Central Gilbert Islands route, and the same number of days on the Fiji route. Among these routes, the longest is the Tarawa-Line Islands route, (itinerary: Tarawa-Christmas-Fanning-Washington-Canton-Tarawa) that has a total service distance of 3,773 nautical miles. With a speed of 10 knots, it would take 15.7 days (16 days) to voyage this route. Spending two days for loading /unloading at each island, it would take 24 days on the whole. Therefore, the service plan of 26 days, including two days in reserve for bad weather, rough seas, etc., is adequate. As for the service speed of the new multipurpose cargo vessel, 10 knots is regarded as necessary.

For reference, the situations of existing vessels belonging to SCK are as follows:

Moanaraoi: planned speed 9.75 knots (8.5 knots at present)
Nei Mataburo: service speed 9.5 knots.

(6) Endurance

As stated above, the distance of both routes between Tarawa Island and the Line/Phoenix Islands is 3,773 nautical miles, and consideration should be given for refuges during bad weather.

Therefore, 5,000 nautical miles is an adequate endurance for the above route and also for the Fiji route which is 2,650 nautical miles. Furthermore, the Nei Mataburo also has an endurance of 5,000 nautical miles, and the new vessel is to navigate in almost the same service condition. Therefore, this endurance for the new multipurpose cargo vessel should be adequate.

(7) Containers

The Shipping Corporation of Kiribati strongly requested a grant of one set of containers as well as the vessel itself. The corporation showed a plan corresponding to the eventual grant of the containers as mentioned in 3.2.2(3). In general, owners of container vessels have their own containers, and it is indispensable to have containers on hand so that they can be used effectively on container vessels. On the other hand, it is very difficult to raise funds for containers from the corporation's budget. If SCK has no containers on hand, they must lease them. But paying the lease charge would raise maintenance and management costs. Therefore, at least one set of containers should be provided in order to make effective use of the vessel as well as to stabilize the management of the Shipping Corporation of Kiribati.

(8) Spare Parts

In general, in developing countries, it requires a long time for the procurement of spare parts. Once the spare parts supply is exhausted, the transportation services are subject to interruption. If we provide enough spare parts for two years at the completion of the vessel and if SCK procures replacements on a timely basis, they will always hold a number of spare parts. There will be no anxiety for the operations. Moreover, one propeller and its propeller shaft set should be provided regularly as special spare parts for the special condition of the vessel sailing in this maritime zone where coral reefs abound.

3.2.5 Considering the Need for Technical Cooperation

Since there has been no particular request for technical assistance and

since, as mentioned under items 3.2.2, conditions in the Republic are deemed sufficient to deal with the operation and management of vessels, in our considerations regarding requirements for this project, we have come to the conclusion, that there is no need for technical assistance.

3.2.6 Fundamental Policies regarding the Implementation of the Cooperation Program

As a result of our studies mentioned above, we were able to determine the propriety of the project, its practicality and the capability of the Republic of Kiribati for its implementation and other relevant factors, and came to the conclusion that the results of the project would fully justify a Japanese government grant. On the assumption that such a grant will be made, we will examine the project here and consider its implementation of the basic design for the multipurpose cargo vessel.

3.3 PROJECT DESCRIPTION

3.3.1 Executing Agency and its System of Operation

(1) The structure and organization of the Ministry of Transport and Communication

The Ministry of Transport and Communication under the supervision of the minister is divided into five departments, the secretariat, aviation, shipping, postal services and meteorological office. As of December 1990, the number of employees from the secretary on down was 80. There are also five public corporations related to the Ministry. They are Air Tungaru, Shipping Corporation of Kiribati, Betio Shipyard Ltd., and Kiribati Telecom.

The budget for yearly expenditures by Kiribati's Ministry of Transport and Communications is expected to total some A$1.1 million in fiscal 1991 (Table 3.3.1). The reason for the decrease from the level of 1987-1989 is that the repayments are now completed for a loan to enable the purchase of a small aircraft (A$300,000 in 1987, A$380,000 in 1988, and A$196,000 in 1989). The ministry's revenue from transportation operations has gradually increased. Transportation is expected to earn about A$290,000 in 1991, and the

balance of revenue and expenditure, A$810,000, will be covered by funds from the Kiribati Ministry of Finance.

TABLE 3.3.1 Transition of the Ministry's Budget

Unit: Australian dollar (A$)

	1987 actual	1988 actual	1989 actual	1990 budget	1991 budget
Revenue	219,346	214,162	251,361	240,660	286,100
Expenditures (breakdown)	1,215,839	1,280,955	1,111,138	1,077,330	1,099,568
Personal expense	228,552	264,373	376,380	357,020	386,758
Other	987,287	1,016,582	734,758	720,310	712,810
Deficit	996,493	1,066,793	859,777	836,670	813,468

Source: Ministry of Transport and Communications

In the details of the 1991 budget in Table 3.3.2, 63% of the revenue--about A$290,000--comes from revenue related to postal services. The revenue associated with the shipping of Kiribati is only about A$24,000, or 9%, of the entire amount. This is because the revenue included in the Table comes only from administrative charges (from seamen's licenses, vessel registration fees, etc.). Revenue from passenger and freight charges, etc. is included in the earnings of SCK.

Conversely, 52% of the expenditure of about A$1.1 million is for personnel and general expenses, whereas expenditures associated with marine transportation total about A$92,000, or 9%.

TABLE 3.3.2 Details of the Ministry's 1991 Budget

Unit: Australian dollar (A$)

Classification	Item	Amount
Revenue	Postal service	181,000
	Aviation service	81,000
	Shipping service	24,100
	Total	(286,100)
Expenditures	Personel expense	386,758
	General expense	187,000
	Postal service	184,100
	Aviation service	105,500
	Shipping service	92,610
	Subsidy for Kiribati Telecom	112,600
	Subsidy for Betio Shipyard	30,000
	Total	(1,099,568)
Deficit		813,468

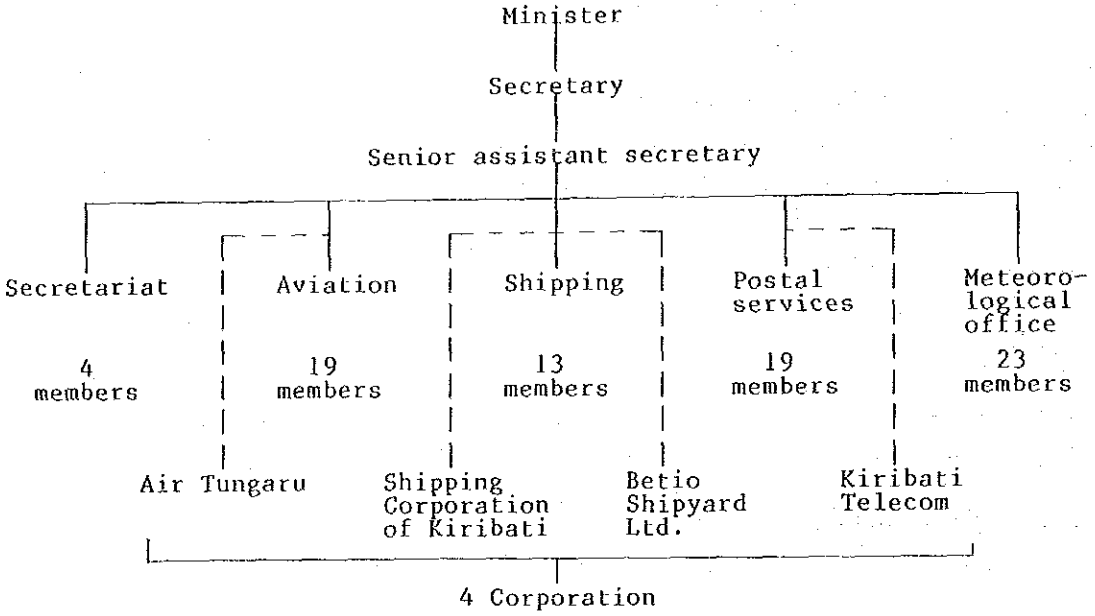
Source: Ministry of Transport and Communications

Shipping Corporation of Kiribati and Air Tungaru both are statutory and self-supporting enterprises. Betio Shipyard Ltd. and Kiribati Telecom, on the other hand, are ordinary government holding companies and at times receive subsidies from the Ministry of Transport and Communications. Such subsidies for 1991 are estimated to amount to A$ 30,000 for Betio Shipyard and A$ 113,000 for Kiribati Telecom.

The organization chart of the Ministry of Transport and Communications is shown in 3.3.1. All the 80 employees from the secretary on down, except for two New Zealanders who are in charge of meteorology are from Kiribati. The supervision of the SCK is exclusively conducted by the secretary and senior assistant secretary. In 1990, shipping safety regulations and qualification standards for ship personnel in Kiribati, underwent radical reforms and new laws were enacted. The contents of these new laws and regulations are based on relevant international treaties. Regulations regarding the safety of life at sea are based on the international convention SOLAS , and those regarding the training of ship personnel, qualification certificate standards and other related

topics on the international convention on standards of training certification and watchkeeping for seafarers, 1978 (STCW). The country, abolishing older laws, formally adopted The South Pacific Maritime Code, which was established by the South Pacific Bureau for Economic Cooperation.

Chart 3.3.1 Organization Chart of the Ministry of Transport and Communications



(2) The structure and organization of the Shipping Corporation of Kiribati

The Shipping Corporation of Kiribati is a hundred per cent government financed organization established under a special statute and is based in Betio on Tarawa Island. 3.3.2 shows the organization chart of the corporation. Policy decisions in the corporation are made by six members of the Board of Directors. Under the supervision of the General Manager the corporation is divided into the following 5 administrative departments: personnel, financial, operations, engineering and port management departments. The six directors, one each from the Ministry of Transport and Communications, the Ministry of Finance and Economic Planning, the Ministry of Trade, Industry and

Labor, the President's Office, the Kiribati Wholesale Cooperative (KWCS), main shipper of the SCK, and a hundred per cent government financed company and the Abamakora Trading, are selected and appointed by the Minister of Transport and Communications. The chairman of the SCK is a senior assistant secretary from the Ministry of Transport and Communications.

With 194 employees working under the supervision of the General Manager, the corporation is one of the largest enterprises in Kiribati. A proposal, however, which would separate the Port Management Department of the corporation and establish the Independent Ports Authority was deliberated in the Parliament and approved as of December 1990. Because plans for the breakup of the corporation have been approved, the shipping division of the Shipping Corporation, while remaining a hundred per cent government financed enterprise, will be re-organized into a stock company, the Kiribati Shipping Corp in the near future.

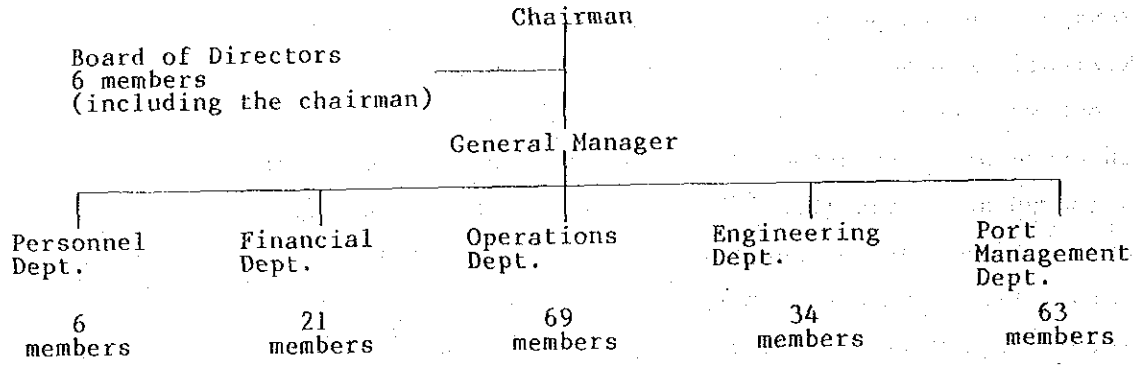
The Port Management Department is the sole authority for cargo-handling at Betio, which is the country's largest port. The department is in charge of agencies dealing with offshore and coastal cargo-handling, a storage house and a shipping agency. However, since the second port in the country, the London Port on Christmas island, is under the control of the ministry in charge of the Line and Phoenix islands, the Ports Authority even if established, will remain in charge of Betio Port only.

The Shipping Department of the corporation is in possession of three cargo vessels and two crafts for the transportation of cargo and passengers shore to shore and carries out most of the transportation of cargo and passengers in the country. At times it also transports goods and passengers to and from neighboring countries such as Fiji. The operational structure of the corporation is to remain unchanged after the planned breakup.

The 194 employees under the supervision of the General Manager, are all natives, who have either received the kind of education deemed necessary for executives and ship staff, or are in possession of

suitable credentials. They are well experienced and manage the corporation in accordance with a flexible style of management, leaving no room for worry in the day to day handling of the company's business.

Chart 3.3.2 The Organization Chart of the Shipping Corporation of Kiribati



(3) Government Subsidy

In order to adjust price levels on outer islands and make them reflect those on Tarawa, the government prior to 1978, has introduced a system of subsidies which aims to reimburse owners of imported goods other than those specified transported to the outer islands for transportation expenses incurred. According to this system the government reimburses owners for their transportation costs for all imported items other than those specified transported from Tarawa to the outer islands and for all items other than copra and construction materials transported from the outer islands to Tarawa. Such subsidies cover 100 per cent of the transportation cost, if goods are transported between Tarawa and Gilbert islands, and 70 per cent of such costs if they are being transported between Tarawa and Line and Phoenix islands since February, 1990. This, in essence has meant the subsidization to consumers of imported goods in outer islands.

To finance this program, the Ministry of Finance and Economic Planning has created a fund by imposing an import surcharge on all imported goods other than those specified, the rate from 1989 being A$ 25 per freight ton. Owners who can produce documents, proving

payment of transportation charges to SCK for imported goods shipped to outer islands, are reimbursed with the appropriate amount of money from the fund.

In addition, as part of measures to facilitate the settlement of the Northern Line Islands (Washington and Fanning Islands), the Ministry of Home Affairs and Decentralisation with the assistance of the New Zealand government charters ships from the SCK or private shipping companies, a number of times yearly (about 30 days) and uses them to ferry goods and passengers between Gilbert and the Northern Line Islands. Under this system, shipping companies, irrespective of the size of the vessel and number of passengers, are paid A$ 2000 per day by the government (A$ 60,000 a month). The vessels carry about 120 settlers and their belongings on each trip.

3.3.2 Plan of Operation (Activity)

(1) Project plan

The navigation results in 1989 for the three cargo vessels operated by the Shipping Corporation of Kiribati (the Moanaraoi, the Nei Momi, and the Nei Mataburo) were 86 voyages in total: 75 domestic outer island voyages, and 11 international voyages. All voyages originated from Port Betio. These voyages were five to 20 days long in the Gilbert Islands and 30 days long to the Line Islands. The number of days at sea was not constant. As for the Phoenix Islands voyage, there are two routes: the Tarawa-Christmas Island route of 1,770 nautical miles (7.5 days at 10 knots), and the Tarawa-Canton Island route of 950 nautical miles (4 days at 10 knots). For each route, 4-6 annual voyages and 2-5 voyages are planned, respectively. But generally, a cargo vessel runs through both two routes at one voyage, and thus takes 4-6 voyages a year by the two routes. As for the northern Line Islands, the government has allocated vessels to this region since 1988 as a part of the resettlement project. Some important issues have to be considered as follow.

1) Although at the present time the execution of the project is slowing, two voyages a year are still scheduled by government-

chartered vessel for the resettlement project. Furthermore, the potential demand for transportation is large at Christmas Island.

2) Container transportation is conducted by foreign vessels between Hawaii and Christmas Island at a high tariff (US$200 per F/T). If a regular, subsidized service is inaugurated on the Tarawa-Line Islands route, the import traffic from the Fiji Islands and Australia via Tarawa is expected to increase rapidly to supersede traffic from the United States.

(2) Shipping service plan of new multipurpose cargo vessel

With due regard to issues above, the Shipping Corporation of Kiribati has set up the service plan as shown in Table 3.3.1. (See Minutes of Discussion in the Appendix.)

TABLE 3.3.1 Service Plan of the Multipurpose Cargo Vessel

Route	Departure Place	Destination	Voyage Days	Frequency	Total Voyages
Tarawa/ Line Islands	Tarawa	Line Island Phoenix Islands	26 days	Every 6 weeks	8
Gilbert Islands	Tarawa	Southern Gilbert Islands	20 days	Every 13 weeks	2
		Central and Northern Gilbert Islands	20 days	Every 13 weeks	2
					4
Fiji	Tarawa	Fiji	20 days	Every 13 weeks	2

The service plan for the new multipurpose cargo vessel puts emphasis on the Tarawa-Line/Phoenix long distant route, according to the policy of the Shipping Corporation of Kiribati. But because the cargo and passenger transportation for the Gilbert Islands and the import traffic from Fiji are also taken as important items of the

project, these matters are reflected clearly in the plan. According to this plan, the Nei Momi and the Nei Mataburo will be allocated exclusively to the north-central Gilberts and southern Gilberts short range routes. If a break in these transportation services occurs in any of these routes for reason of annual vessel repair, the new cargo vessel is expected to back up that service.

3.3.3 Outline of Vessel and Equipment

Taking account of what is mentioned above in 3.2.4 and 3.3.2, the outline of the new multipurpose cargo vessel is as follows.

(1) Number of containers

In 3.2.4(2), the number of required containers, 41, is judged reasonable in consideration of the demand for container freight in future. If, however, quarters for complement and passengers are located aft, and if a hold is located at the forward part, the initial arrangement plan (which is attached to the requests of the Kiribati government) cannot assure sufficient space for winches for container loading and unloading. To load more than 40 containers, the length of the vessel should be extended by more than five meters. An extension of the vessel length, however, would cause an increase in vessel weight. In this case, the place for repairing would have to be changed from Fiji, the present site, to another port. In conclusion, the number of loading containers on this vessel is 36 when loaded in one row on the upper deck (39 can be loaded when part of them loaded in two layers).

(2) Cargo hold capacity and facilities

The containers mentioned above will be situated inside the hold in two layers. With the space around the containers, the cargo hold has a capacity of about 1,800 M^3 (cubic meters). In interisland transportation, bulk cargo is also to be loaded instead of containers. Therefore, the facilities in the cargo hold should be designed so that both containers and bulk cargo can be stowed inside the hold.

(3) Deadweight

Despite the need for more than 40 containers indicated in 3.2.4(2), the number of onboard containers will be reduced to 39. Considering that a container (which includes its content) has a weight of 18 to 20 tons, if containers are used, the total cargo weight can be calculated as: 39 (numbers) x (18-20) tons = 702-780 tons.

Other than cargo weight, the deadweight contains the weight of fuel, drinking water, food, etc. Their total weight is 255 tons at fully loaded condition. Thus, the loaded weight is expected to be 957-1035 tons. The deadweight is fixed at 1,000 tons, as required.

(4) Number of persons on board and living quarters

The number of persons on board and their living quarters are as follow.

Complement

Officers	: 6 persons	- one room for each person
Ratings	: 7 persons	- two rooms for two persons each (supercargo, boatswain)
		- one room for two persons (steward, cook) with a double bunk
		- one room for three persons (sailors, etc.) with a double bunk and a single bed
Cadet seamen	: 16 persons	- two rooms; in each room 8 persons to sleep on 4 double-bunks
Instructor	: 1 person	- one room

Cabin

Passengers	: 6 persons	- 3 rooms; in each room, 2 persons to sleep on 1 double-bunk
Deck passengers	: 50 persons	- on the aftward poop deck

(5) Accommodations and sanitary facilities

1) Accommodations

A galley serves for both officers and crew. A pantry is provided for the officer's messroom. An officer's messroom is provided for officers and cabin passengers. A crew messroom is provided for crew and seamen cadets.

2) Sanitary facilities

A dispensary is provided as required by the International Convention on the Safety of Life at Sea. A sewage treatment unit for 40 persons is provided.
Lavatories and shower rooms are supplied as follow.

TABLE 3.3.2

Name of room	No. of personnel	Lavatory	Shower room
Captain	1	1	1
Chief engineer	1	1	1
Officers, Cabin passengers	11	2	2
Crew, Seamen cadets	23	3	3
Deck passengers	50	3	2
Dispensary	–	1	1
Total	86	11	10

3) Provision storeroom and the use of fresh water

The standard volume of food stock shall be good for the consumption of 86 persons for 26 days. Fresh water shall be stored for the consumption of 86 persons for 26 days with the assumed consumption rate of 50 liters per capita per day. Refrigerating

equipment (refrigerator and freezer) is provided for the provision store room of freezed food. Hot water is supplied only to the galley.

(6) Ventilation and air conditioning

Living quarters are provided with mechanical supply and exhaust ventilation system together with an air-conditioning system for cooling only. The engine room is also provided with mechanical exhaust ventilation system, as are the galley, lavatory and shower room. Cargo holds are provided with natural ventilation.

(7) Cargo-handling gear

Cargo loading and unloading are conducted by derrick. Equipment such as winches are provided for both the forward and after cargo holds. The S.W.L. of the derrick shall be more than 25 tons to enable container handling. Cargo hatches shall be of the flat- and pontoon-type cover for both the weather and second decks. Removed hatch covers shall be stacked during loading and unloading work. Hatch covers on the second deck shall be designed to be flush with the deck surface so that two-ton forklift trucks can smoothly drive on the deck.

(8) Lifesaving appliances and fire-extinguishing system

Lifesaving appliances and fire-extinguishing system are provided in accordance with the rules and regulations of the international conventions and the classification society.

(9) Miscellaneous supplies

Mattresses, bed sheets, blankets, etc. are provided for bunks in living quarters. Cooking ware and tableware are provided for the galley and the mess rooms. A set of general tools and deck investories are supplied.