

(10) Main engine

One set of main diesel engine with sufficient output for the designed service speed is provided.

(11) Generator

Three sets of diesel generators are provided. Two are operated at sea and another is operated in port.

(12) Fuel

The fuel for the main engine and generators is diesel oil.

3.3.4 Operation and Maintenance Plan

(1) Quality control while shipbuilding

The new vessel shall be built in compliance with the regulations of international conventions and the classification society. The classification society shall inspect the hull and the equipment, including the main engine, to ensure its seaworthiness, safety and performance. It is planned that the new vessel will undergo classification by the Nippon Kaiji Kyokai (NK), which is one of the international classification societies such as Lloyd's Shipping of the U.K. and the American Bureau of Shipping of the United States. NK's guarantee of quality is a requirement for insurance for hull construction and for cargo.

Every government issues certificates of compliance with international conventions. Classification societies, however, can be authorized to issue these certificates by the government, whose contents are verified for the renewal by periodic inspection conducted by classification societies every four years.

The government of Kiribati is expected to entrust Nippon Kaiji Kyokai (NK) with the power to issue the certificate of compliance with international conventions while the vessel is under construction. (The same procedures as this were taken for the Nei Mataburo, the previous vessel given to the government of Kiribati as

a Japanese grant.) The Kiribati Ministry of Transport and Communications is to verify the contents of the inspection conducted by the classification society to issue the certificate of compliance with the safety standards.

(2) Quality control after commissioning of the vessel

The new vessel is to undergo inspection by the Ministry of Transport and Communications upon completion to be maintained and controlled by Shipping Corporation of Kiribati. Inasmuch as this corporation has owned many ships since before the independence of Kiribati in 1979, and has been undertaking the maintenance, control, and operation of these vessels, it is considered that there is no doubt regarding the ability of this corporation. Needless to say, the crew of the ship shall undertake the daily work of maintenance and control of the vessel, where officers in charge of each section are responsible for the control under the coordination of the captain. Therefore, the shipbuilder and other responsible organizations shall give sufficient instructions to the crew on the procedures for maintenance and repairs as well as on the equipment operation methods. This shall be done during shipbuilding and for a certain period after commissioning so that the crew can fully acquire skills in the equipment maintenance methods. The engineering division of the Shipping Corporation is responsible for the maintenance of vessels, performing such tasks as acquiring the materials required for maintenance and repairs, controlling spare parts inventory, and giving instructions to shipyards while supervising repair work.

After entering service, the vessel is subject to the annual inspection of the classification society in accordance with the designated procedures. This is done to ensure performance as to the time of completion and the compliance with safety standards, whose clearance largely depends on the appropriate planning of the corporation.

(3) Expense for operation and maintenance

The payability estimated by the Shipping Corporation of Kiribati according to the service plan of the new vessel is shown in the

following Table 3.3.3. This estimate shows that annual income from transportation fares will amount to about A\$1,210,000; the annual management cost will amount to about A\$950,000; and that the annual profit will amount to about A\$260,000. Because this is not enough to cover depreciation, the estimate for this project will be in the black with the introduction of grant aid system that require no initial investment. As to the expense for repairing, this costs about A\$100,000 (1 percent of the new ship's cost) and is reasonable.

For the Moanaraoi in 1989, about \$A570,000 was paid for repairs. Thus, the new vessel will be no problem for SCK operation and maintenance.

TABLE 3.3.3 Payability of the New Vessel (annual basis)

unit: Australian dollar(A\$)

| | | | |
|-------------------|-----------------|-----------|--------|
| Income | Cargo fares | 1,110,900 | Note 1 |
| | Passenger fares | 97,288 | Note 2 |
| | Total | 1,208,188 | |
| Expense | For ship | | |
| | Personnel | 93,596 | Note 3 |
| | Food | 41,000 | |
| | Fresh water | 4,032 | |
| | Insurance | 62,600 | |
| | Repairing | 100,000 | |
| | Subtotal | 301,228 | |
| | For service | | |
| | Fuel | 351,038 | Note 4 |
| | Port fees | 19,360 | Note 5 |
| Loading/unloading | 126,815 | Note 6 | |
| Subtotal | 497,213 | | |
| Sundry Expenses | 150,000 | Note 7 | |
| Total | 948,441 | | |
| Profit and Loss | | 259,747 | |

Source: SCK Materials

Note 1: Details of cargo fares

| Line | | Frequency of voyage | Total Cargo Volume (F/T) | Fare | Fare Amount |
|--------------------|---------------------|---------------------|--------------------------|------|-------------|
| Line/Phoenix route | Loading in Tarawa | 8 | 4,400 | 120 | 528,000 |
| | Unloading in Tarawa | 8 | 1,450 | 82 | 118,900 |
| Gilbert route | Loading in Tarawa | 4 | 1,400 | 90 | 126,900 |
| | Unloading in Tarawa | 4 | 1,400 | 70 | 98,000 |
| Fiji route | | 2 (both ways) | 2,000 | 120 | 240,000 |
| Total | | | 10,650 | | 1,110,900 |

Note 2: Details of passenger fares

| Line | | Frequency of voyage | Deck/Saloon Passage (Person) | Fare | |
|--------------------|---------------------|---------------------|------------------------------|------------|--------|
| | | | | Unit Price | Total |
| Line/Phoenix route | Loading in Tarawa | 8 | 400/48 | 70/299 | 42,352 |
| | Unloading in Tarawa | 8 | 400/48 | 70/299 | 42,352 |
| Gilbert route | Loading in Tarawa | 4 | 200/24 | 17/65 | 4,960 |
| | Unloading in Tarawa | 4 | 200/24 | 17/65 | 4,960 |
| Fiji route | | 2 (both ways) | 0/12 | 45/222 | 2,664 |
| Total | | | 1200/156 | | 97,288 |

Note 3: Details of personnel expenses

| | |
|--------------------------------------|--------|
| Base Wages (officers: 6, ratings: 7) | 58,636 |
| Voyage Allowance | 20,427 |
| Shift Cost, etc. | 14,533 |
| Total | 93,596 |

Note 4: Details of fuel expenses

| Route | Frequency of Voyage | Sailing Days | Anchorage Days | Total Days |
|------------------------------|---------------------|--------------|----------------|-------------------|
| Line/Phoenix route | 8 | 96 days | 112 days | 208 days |
| Gilbert route | 4 | 40 | 40 | 80 |
| Fiji route | 2 | 20 | 20 | 40 |
| Total | 14 | 156 | 172 | 328 |
| Fuel Consumption per Day (t) | | 3.5 t /day | 0.35 t /day | |
| Annual Fuel Consumption | | 546 t /year | 60.2 t /year | 606.2 t |
| Unit Price of Fuel | | | | A\$490 |
| Total | | | | A\$297,038 |
| Gasoline | | | | A\$18,000 |
| Other | | | | A\$36,000 |
| Total | | | | A\$351,038 |

Note 5: Details of port expenses

| | |
|------------------------|---------------|
| Port Dues | 16,989 |
| Pilotage Fee | 502 |
| Quay Fee in Fiji | 1,869 |
| Total | 19,360 |

Note 6: Details of loading and unloading expenses

| | |
|------------------------------|----------------|
| Domestic | 108,125 |
| In Fiji (Fiji\$20,000) | 18,690 |
| Total | 126,815 |

Note 7: Details of sundry expenses

| | |
|--------------------------------|---------|
| Store Cost | 75,000 |
| Sundry Expense of Voyage | 35,000 |
| Reserve | 40,000 |
| Total | 150,000 |

(4) Shipyard for repair work, etc.

Minor repair work is performed at the Betio Shipyard as mentioned in Clause 2-4-1, apart from repairs done by the crew. The Shipping Corporation is planning to have annual repair work and inspection including slipway repair work done at the Fiji Marine Shipyard, which is capable of slipway repair work for vessels of 1,000 tons or less of ship's weight.

The repair work for the Moanaraoi and the two other large vessels owned by the Corporation have been conducted at the Fiji Marine Shipyard and other nearby subcontractors.

The Fiji Marine Shipyard, in particular, has been implementing the repair work for not only the vessels of SCK, but also for other vessels operating in Fiji's ambient waters. Because the yard has no equivalent nearby, it is extensively employed. The yard, with lengthy ship repair experience, seems to have no technical repair problems except as regards complicated equipment.

CHAPTER 4 BASIC DESIGN

CHAPTER 4 BASIC DESIGN

4.1 DESIGN POLICY

After examination of the contents of the requirements of the Kiribati government and taking the propriety of the plan into consideration, the basic design policy of this vessel has been determined to satisfy the characteristics of the vessel as a multipurpose cargo vessel for carrying containers, general cargo, and deck passengers for domestic voyage only.

Especially, under the present situation of the Republic of Kiribati, the following items should be regarded.

4.1.1 Safety of the Vessel

To achieve vessel safety, it is necessary to apply the International Convention for the Safety of Life at Sea (SOLAS), the International Load Line Convention, International Telecommunications Radio Regulations, the IMCO Recommendation on Intact Stability, and the International Regulations for Preventing Collisions at Sea. It is also important to select a hull shape of high performance to maintain good maneuverability and stability for oceanic navigation, as well as stability for safe offshore anchorage cargo handling.

4.1.2 Suitability for Use

The equipment and installations for transportation and container and general cargo handling, which are the major uses of the vessel, should be suitable for these purposes and easy to handle. It is also necessary to install equipment to enable deck passengers to board and leave the vessel safely and to travel in comfort. The crew accommodations should be as simple as possible and suited to the needs of the Kiribati crew.

4.1.3 Correspondence to Maintenance Ability of Executing Agency

In consideration of the ability of maintenance and the level of the crew, the vessel's equipment must be easy to handle and to maintain. Moreover, executive agency budgetary actions should also be easy. As for spare parts, they should be in ample supply to ensure continuous

operations. The energy consumption of the vessel should be kept to a minimum.

4.1.4 Construction Period

Because this project is part of Japan's Grant Aid system, the construction plan must be efficient. The treatment of each part, such as hull, engine, and electric, must be easy and free of omissions.

Once the construction begins, consultants should give prompt approval, and supervise the construction work to be enforced precisely according to a plan that enables performance of the vessel at the sea trials to confirm the accomplishment of the vessel as planned.

4.2 STUDY ON DESIGN CONDITION

In the process of designing a multipurpose cargo vessel, the conditions to be observed are as follow.

4.2.1 Natural Conditions

Because Kiribati is in the tropics, even in rainy seasons the highest temperature in daytime rises to 42-45°C and heavy rains occur in very brief periods. The temperature of the seawater is also as high as 32°C. There are no strong winds except for gusts, but in the sea there are swells characteristic of the Pacific. Under such conditions, the following items should be considered.

- (1) An air temperature of 45°C, a seawater temperature of 35°C, and wind velocity of 30 m/sec.
- (2) Enlarge the area of freeing ports and the diameters of scupper pipes to facilitate smooth weather deck drainage.
- (3) Examine data from existing vessels before deciding the hull shape and rudder area, to maintain adequate seaworthiness and maneuverability.

4.2.2 Geographical Conditions

Because most of Kiribati's islands are coral reefed and surrounded by atolls, the anchorages are shallow. Quay facilities, moreover, are insufficient or completely lacking. Under such conditions, the following items should be considered.

- (1) Maximum draft of the ship should be about 4.0 m, and about 5.0 m even in trim condition.
- (2) Install cargo gears to enable cargo handling even while anchored offshore.
- (3) Install equipment that enables deck passengers to board and disembark debark safely.
- (4) Planning of tanks and provision storage to enable navigation of 5,000 miles without replenishment.

4.2.3 Repair Equipment and Facilities

A vessel of less than 100 tons can be slipped up and repaired in the Betio shipyard in Kiribati. Heavier vessels must be repaired offshore. The dockyard in Fiji, moreover, where most Kiribati vessels go for repairs, cannot slip a ship weighing more than 1,000 tons. Accordingly, the following items should be considered.

- (1) Apply stronger anticorrosives for vessel's hull and equipment.
- (2) Plan a lightweight vessel of about 900 tons.

4.2.4 Domestic Laws and Regulations and International Treaties to be applied (mutatis mutandis) to Hull Construction, Equipment Installation, etc.

While being based upon the field survey, the South Pacific Maritime Code is to be applied mutatis mutandis for the design of the vessel. Also, the International Convention for the Safety of Life at Sea (SOLAS) and

other international regulations should be applied or observed mutatis mutandis.

From the period of construction, classification and notation of the vessel should be executed by the Nippon Kaiji Kyokai (NK). The government of Kiribati shall authorize NK to issue the required certificates to accord with these international regulations.

4.3 BASIC PLAN

In addition to determination of the scale of the vessel as described in Chapter III, with the examination of the conditions for designing mentioned in the previous paragraphs, the requirements of the Kiribati government were partly amended and settled to be the basic design as follow.

4.3.1 Determination of Principal Dimensions

For the determination of principal dimensions, the limitations of draft and weight of the vessel should be remembered.

The length of the vessel should be as short as possible to keep the hull weight minimal. The cargo condition of the vessel may vary depending upon the cargo, so that it shall be equipped with more ballast tanks than usual to adjust the heeling and trimming of the vessel. Also, the breadth of the vessel is planned to be in a smaller length/breadth ratio than a general cargo vessel, so that heeling during cargo handling can be minimized.

The depth of the vessel shall be decided according to the size of containers. The hatch coaming should not be too high.

4.3.2 Planning for Hull

(1) Hull Construction

Steel plates and angles for hull construction shall be mild steel approved by a classification society. The hull, which is all welded and of transverse framing structure, shall be divided by four transverse bulkheads. The hull should be reinforced with necessary

under-deck girders and pillars.

To afford an unobstructed view, a four-storied deckhouse shall be built on the upper deck with a wheelhouse on its top. Because the deckhouse is multistoried, its plan for construction must be well-considered in terms of strength and resistance against vibration.

(2) Hull fittings

- 1) Deck Machinery: Deck machinery such as the windlass shall be electrohydraulic for ease of handling and maintenance.
- 2) Cargo hold and cargo hatch: Cargo holds should be able to load containers and general cargo. Moreover, it shall be planned to load containers on the cargo hatch cover on the upper deck. During the field survey, the Kiribati side requested a single pull-type hatch cover. But (a) to minimize hull weight, (b) make hatch-cover handling easy, and (c) minimize the vessel length, a pontoon-type hatch cover shall be selected. As for the cargo hatch cover for the second deck, it will also be pontoon-type, but should be resistant to the weight of a cargo-carrying forklift.
- 3) Accommodations: Accommodations shall include quarters and installations for crew, trainees and cabin passengers. For deck passengers, only sitting space, toilets and shower rooms are provided. Furniture shall be made of wood or steel and arranged functionally.

Moreover, a galley, pantry, provision stores, messrooms, a laundry room, toilets, and shower rooms shall be installed where needed.

- 4) Cargo gear: Derrick-type cargo gear capable of cargo container handling should be installed. This shall have a single post in the middle of the vessel and two swing booms stretching fore and aft to handle containers and general cargo on the fore and aft decks. The maximum outreach of each boom from the vessel's side shall be 4.0 m, and the maximum permissible load weight of each derrick boom shall be 25 tons in accordance with the weight of a container. The cargo winch should be electrohydraulic, similar to other deck machinery.

(3) Painting and anticorrosives

- 1) Painting: This vessel should be painted with marine paint-- chlorinated rubber-type paint for the outside shell and oleaginous-type for other parts.
- 2) Anticorrosives: For the hull structure including rudder and stern frame, corrosion protection with zinc plates should be provided.

4.3.3 Planning for Engine and Electrical Parts

(1) Engine-room fittings

- 1) Main engine: The engine section should be planned so as to have propulsion equipment with a single-screw propeller driven by a marine diesel engine installed in the aft engine room. The main engine is a medium-speed marine diesel engine with reduction gear and a clutch--a supercharged, four-cycle, single-acting trunk-piston type. Operation of this main engine shall be controlled from the control stand in the wheelhouse. Starting and stopping the main engine are done only at engine side. Concerning these operations, alarm and safety systems shall be installed.

The fuel for the main engine and the diesel engine generators shall be marine diesel oil.

The capacity of the engine room auxiliary machinery corresponds to the output power of the main engine. The machinery capacity and numbers shall be determined according to the requirements of the classification society and related organizations.

- 2) Piping systems: Piping systems for fuel oil, lubricating oil, cooling water, compressed air, ballast, freshwater, and hot water should be installed. The piping system for hot water, however, is laid only in the galley and not in shower rooms.

Material used for piping is all steel, but that for drinking and hot water systems is stainless steel. To distinguish the types and

flow directions of these pipes, color tapes shall be wound on them.

- 3) Arrangement of engine rooms: The main engine and the auxiliary machinery in the engine room are arranged to exhibit their abilities. This is done to facilitate operations, maintenance, and repairs; and to reduce risks, such as fire.

(2) Electrical equipment

- 1) Generators: The electrical capacities of the two diesel generators and single port-service generator shall be determined to make the following operations possible.

- (a) Harbor departures and arrivals: two generators operating in parallel
- (b) Usual voyage: one generator in operation
- (c) Cargo handling upon harbor arrival: two in parallel
- (d) Harbor arrival (without stevedore): one port-service generator

- 2) Other equipment: Equipment for power distribution and radio communication and nautical instruments shall be arranged under the International Telecommunication Radio Regulations, International Convention for the Safety of Life at Sea, etc.

4.3.4 Outline of Specifications and General Arrangements

According to the above-mentioned basic design, the out-line specifications and general arrangement plan shall be as follow.

Outline Specifications
of
Multipurpose Cargo Vessel

I. HULL

1. General

The vessel shall be designed and constructed as multipurpose a cargo vessel suitable for carrying general cargo containers and deck passengers.

The vessel shall be engaged in international voyage as a cargo ship. The vessel, however, shall not be engaged in international voyage when she carries deck passengers.

Material, machinery, equipment and the like shall be of Japanese make.

2. Classification and Rules

Classification and notation: Nippon Kaiji Kyokai (NK)

NS*, MNS*

Rules and regulations:

- Rules and Regulations of the Classification Society (NK)
- International Load Line Convention, 1966
- International Convention for the Safety of Life at Sea, 1983 (In applying the SOLAS, the vessel shall be considered as a cargo vessel to be engaged in international voyage)
- International Telecommunication Radio Regulation, 1975
- International Convention for Prevention of Pollution from Ship, 1973 including PROTOCOL 1978
- International Convention on Tonnage of Ships, 1969
- IMCO Recommendation on Intact Stability for Passenger and Cargo Ships under 100 meters in length (A-167)
- International Regulations for Preventing Collisions at Sea, 1972

South Pacific Maritime Code shall be applicable as a criterion in designing.

3. Principal Dimensions

Length, o.a.

Approx. 68.90 m

| | |
|----------------------|---------|
| Length, b.p. | 63.00 m |
| Breadth, mld. | 11.80 m |
| Depth, mld. | 5.90 m |
| Designed draft, mld. | 4.20 m |

4. Deadweight and Tonnage

| | |
|------------------------------|--------------------------|
| Deadweight at designed draft | Approx. 1000 metric tons |
| Gross tonnage | Approx. 1300 tons |

5. Cargo Hold Capacity

| | |
|--------------------------------|------------------------------|
| Cargo holds (in bale capacity) | Approx. 1,800 m ³ |
| Container stowage | |
| in hold | 24 TEU |
| on deck | 15 TEU |
| Total | 39 TEU |

Note: Six (6) reefer containers shall be included in the above and located on deck.

6. Tank Capacity

| | |
|---------------------------|----------------------------|
| Fuel oil tank (100%) | Approx. 115 m ³ |
| Fresh water tank (100%) | 120 m ³ |
| Water ballast tank (100%) | 400 m ³ |

7. Speed and Endurance

Service speed on designed draft at normal output (85%)
with 15% sea margin

Approx. 10.0 knots

Endurance at service speed of 10.0 knots

Approx. 5,000 nautical miles

8. Complement

| | |
|---------------------------------|-------------|
| Officer | 6 persons |
| Rating | 7 persons |
| Seamen cadets and an instructor | 17 persons |
| Cabin passenger | 6 persons |
| Deck passenger | 50 persons* |

* Deck passengers shall be carried only when the vessel is engaged in inter island operation.

9. Hull Construction

| | |
|---------------------|---|
| Hull construction | All welded construction |
| Transverse bulkhead | Plate type with vertical stiffener |
| Stern frame | Cast steel and steel plate fabricated |
| Rudder | Balanced type double plated stream line, area approx. 1/45 of Lbp x d |
| Bilge keel | Fitted about 0.3L amidships |
| Cargo hold | Bottom ceilings shall not be provided. Wooden side sparring shall be fitted. |
| Tank top strength | Tank top shall be strengthened for a forklift truck of 2 tons pay load. |

10. Painting

All paint works including surface preparation and application of shop primer shall be performed in compliance with the Builder's practice.

Shell outside

| | |
|------------------------|---------------------------|
| Bottom | CR AC (HB) x 2, CR AF x 2 |
| Boottop | CR AC (HB) x 2, CR BT x 2 |
| Top Side | CR AC (HB) x 2, CR TS x 2 |
| Exposed deck | UC x 2, DP x 2 |
| Exposed superstructure | UC x 2, FP x 2 |
| Cargo hold | |
| Side wall and overhead | UC (HB) x 1, FP x 1 |
| Tank top | TE x 1 |
| Water ballast tank | TE (HB) x 1 |
| Fresh water tank | EP x 2 |
| Fuel oil tank | Oil wipe |

Abbreviations

| | |
|---|------------------------------|
| : | CR : Chlorinated rubber type |
| | HB : High built type |
| | AC : Anti-corrosive paint |
| | AF : Anti-fouling paint |
| | BT : Boottop paint |
| | TS : Top side paint |
| | UC : Under coat |
| | DP : Deck paint |
| | FP : Finish paint |
| | EP : Epoxy paint |
| | TE : Tar epoxy paint |

11. Cathodic Protection

Suitable number of zinc anode shall be fitted to rudder, stern frame and inside of sea chest for life time of eighteen months.

12. Deck Machinery

| | |
|---------------|--|
| Steering gear | 1 set, Electro-hydraulic 5 t-m, two pump units (50% each) |
| Windlass | 1 set, Hydraulic driven with 2 gypsy wheels and 2 warping ends 7 t x 9 m/min |
| Capstan | 1 set, Hydraulic driven, vertical 5 t x 15 m/min |

13. Anchor and Mooring

| | |
|--------------|--|
| Anchor | 3 sets, Stockless type, 1440 kg each |
| Anchor chain | 1 set, Grade II welded type 34 mm dia x 412.5 m |
| Tow line | 1 set, steel wire (6 x 24) 25 mm dia x 180 m |
| Mooring rope | 4 sets, Polypropylene 32 mm dia x 140 m |

14. Cargo Gear

| | |
|---------------------|---|
| Derrick | 2 gangs, Thomson type single derrick boom, swing boom method S.W.L. 25 tons Outreach 4 meters from the ship's side shell |
| Derrick post | 1 set, single post type |
| Cargo winch | 2 sets, hydraulic driven 8 t x 25 m/min |
| Topping winch | 2 sets, hydraulic driven 8 t x 25 m/min |
| Slewing winch | 2 sets, hydraulic driven with warping drum, 5 t / 43 m/min |
| Hydraulic pump unit | 2 sets, electric motor driven, for winches, windlass and capstan |

Each derrick boom shall be able to operate two actions simultaneously (hoisting + slewing or hoisting + topping).
 These hyd. pump units shall be connected each other for emergency use.

15. Cargo Hatch

| | |
|--------------|---|
| Weather deck | Weather-tight steel pontoon type covers |
| 2nd deck | Non-weather tight steel pontoon type covers |

Note: Size of fore and aft hatch opening shall be of approx. 13.2m x 8.0m, respectively.

16. Life Saving Appliances

| | |
|---------------------------------|---|
| Life raft | 4 sets, davit-launched type, for 25 persons |
| | 2 sets, inflatable class 1, for 20 persons |
| Launching davit | 2 sets, for davit-launched life raft |
| Rescue boat | 1 set, for 6 persons with outboard engine |
| Rescue boat davit | 1 set, gravity type, with electric boat winch |
| Life buoy | 8 sets |
| Life jacket | 40 sets |
| Line-throwing appliances | 1 set |
| Life raft for deck passengers | 2 sets, inflatable class 2, for 25 persons |
| Life jacket for deck passengers | 50 sets (adult) + 10 sets (child) |

17. Fire Extinguishing System

| | |
|------------------|---|
| Cargo hold | Sea water and portable extinguisher |
| Engine room | Sea water, CO ₂ system and portable extinguisher |
| Living quarters | Sea water and portable extinguisher, method III C to be applied |
| Fireman's outfit | 2 sets |

18. Ventilation and Air Condition

| | |
|---------------------------|---|
| Air conditioning | 1 set, Central unit system for living quarters (cooling only) |
| Mechanical ventilation | |
| Engine room | Supply and exhaust |
| Galley and sanitary space | Exhaust |
| Cargo holds | Supply and exhaust |

19. Accommodation Equipment

| | |
|-------------------------|--|
| Galley equipment | 1 - Electric cooking range |
| | 1 - Electric rice boiler |
| | 2 - Electric water boiler |
| | 2 - Electric refrigerator |
| Refrigerating provision | 3 - Chamber with cooling coil |
| | 1 - R-12 compressor |
| Sewage system | 1 - Holding tank to be provided in engine room |

20. Insulation

Wheel house and living spaces shall be insulated at exposed wall and ceiling according to requirements of the rules and regulations.

21. Spare Parts

Spare parts for the regular operating hours of two years including the requirement of Classification Society and manufacturers' standard shall be supplied.

II. MACHINERY

1. Propulsion Plant

Single screw propulsion, which consists of one (1) set of main diesel engine, coupled to one (1) set of line shafting and fixed pitch propeller.

Main engine 1 set, 4 cycle, single acting, truck piston, turbo-charged marine diesel engine with reduction/clutch gear

Max. cont. output:

approx. 1,100 ps x 800 - 900 rpm

Normal output (85%):

approx. 935 ps x 750 - 860 rpm

fuel oil : diesel oil

Propeller 1 set, Four (4) blade Fixed pitch propeller

Stern tube bearing shall be of sea water lubricated rubber bearing.

One spare propeller and shaft to be provided.

2. Electric Generator Plant

Main Generator 2 sets, approx. 275 KVA (220KW), 385V, 50 Hz, 3 ϕ

drip-proof self-ventilated

Generator engine 2 sets, approx. 330 ps x 1,500 rpm,

4 cycle diesel engine

Harbour use generator set 1 set, approx. 125 KVA (100KW), 385V, 50Hz, 3 ϕ

approx. 150 ps x 1,500 rpm diesel engine driven

3. Auxiliary Machinery in Engine Room

Main engine cooling F.W.pump 1 set

Main engine cooling S.W.pump 1 set

Main engine L.O.pump 1 set

Main engine L.O.pump (st-by) 1 set

Reduction gear L.O.pump 1 set

Reduction gear L.O.pump (st-by) 1 set

General service, fire and bilge pump 2 sets

| | |
|------------------------------|-------|
| Ballast pump | 1 set |
| Fresh water pump | 1 set |
| S.W. service pump | 1 set |
| F.O. transfer pump | 1 set |
| F.O. service pump | 1 set |
| L.O. service pump | 1 set |
| Oily bilge separator | 1 set |
| Fresh water distilling plant | 1 set |
| F.O. purifier | 1 set |
| L.O. purifier | 1 set |

4. Remote Control System

Remote control system for the main engine shall be provided in the wheel house.

III. ELECTRIC

1. System Voltage

| | |
|-----------------|--------------------------------|
| Power system | AC 380V, insulated-wire system |
| Lighting system | AC 220V, insulated-wire system |
| Battery system | DC 24V, insulated-wire system |
| Frequency | 50 Hz |

2. Power Equipment

| | |
|--------------|--|
| Generators | 3-phase brushless, drip-proof construction, insulation class F |
| Motors | I.E.C. standard sized, class E, B and/or F insulated, squirrel-cage type induction motors, in general. |
| Switchboards | Drip-proof construction, deadfront type |
| Transformers | Drip-proof constructions, class B insulation dry type |
| Batteries | Lead-acid type storage batteries |
| Cables | Ethylene-propylene rubber insulated type according to Japanese Industrial Standard (JIS) in general. |

3. Lighting

| | |
|-------------------------|---|
| Engine room lighting | Fluorescent lamp, in general |
| Living quarter lighting | Fluorescent lamp, in general |
| Sanitary space lighting | Incandescent lamp |
| Main deck lighting | Mercury lamp type floodlight |
| search light | |
| Cargo hold lighting | Portable incandescent lamp (explosion proof type) |

4. Interior Communication System

| | |
|---|--------|
| Direct telephone | 2 sets |
| 8 stations selective common battery telephone | 1 set |
| Public addressor | 1 set |
| Engine order telegraph | 1 set |

| | |
|------------------------|-------|
| Rudder angle indicator | 1 set |
| Air horn | 1 set |

5. Navigation Equipment

| | |
|---------------------------|-------------------------------|
| Magnetic compass | 1 set, reflector type |
| Gyro-compass & Auto pilot | 1 set |
| Radar | 2 sets |
| Echo sounder | 1 set |
| Speed log | 1 set, electric magnetic type |
| Clear view screen | 2 sets |
| GPS Navigator | 1 set |

6. Radio Equipment

| | |
|----------------------------|-------|
| Radio direction finder | 1 set |
| SSB radio telephone | 1 set |
| VHF radio telephone | 1 set |
| SOS buoy | 1 set |
| Weather facsimile recorder | 1 set |
| Watch keeping receiver | 1 set |

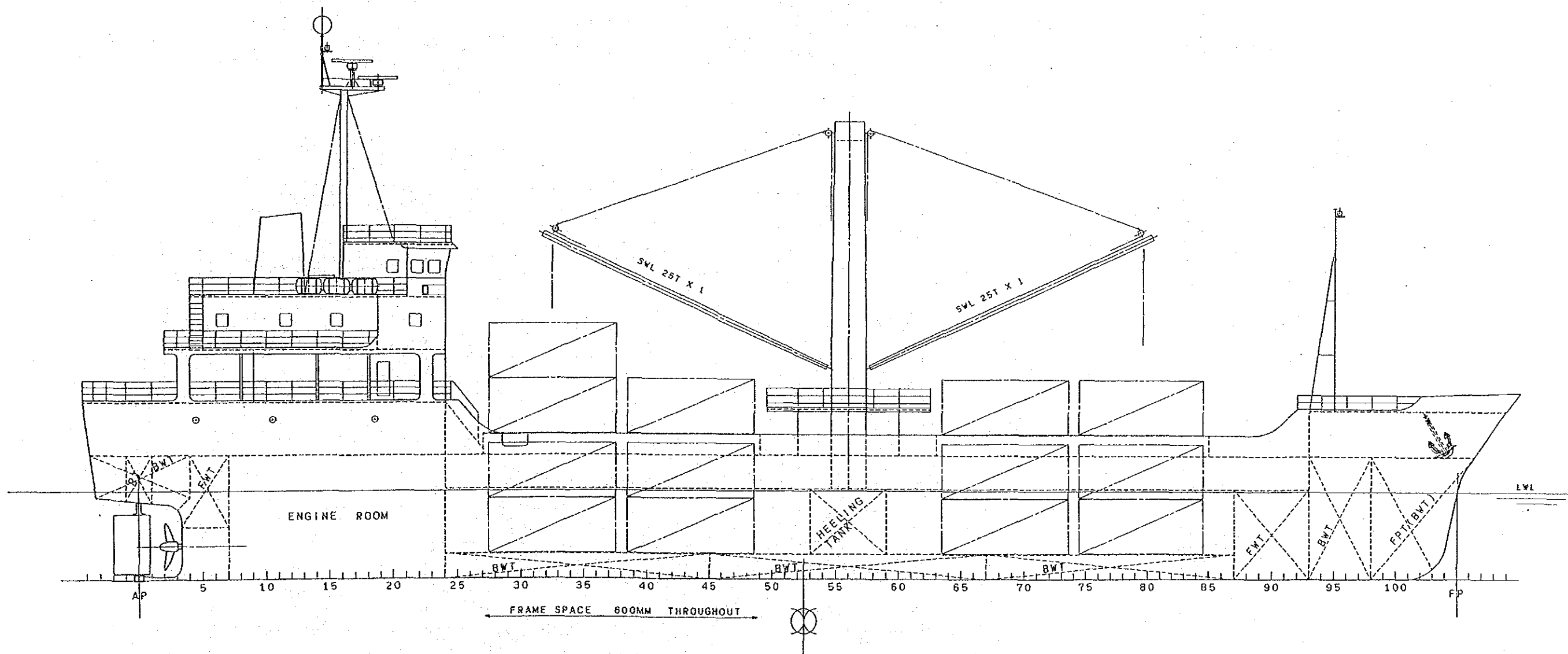
GENERAL ARRANGEMENT

PROFILE

SCALE 1/200

PRINCIPAL DIMENSIONS

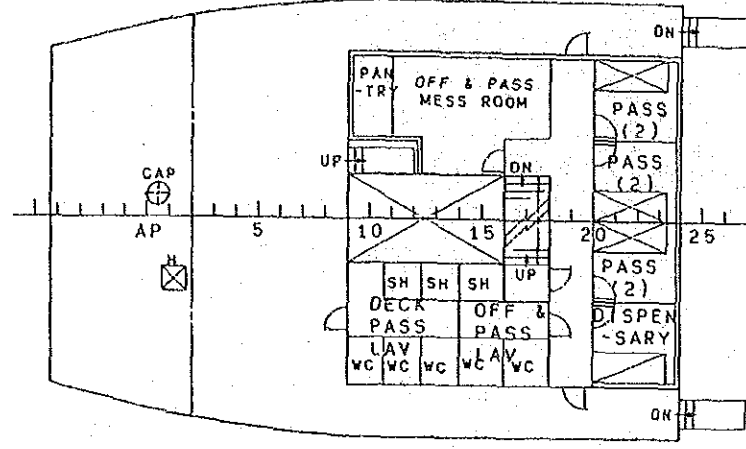
| | |
|-----------------------|--------------------------|
| LENGTH (O. A.) | ABT. 68. ^M 90 |
| LENGTH (B. P.) | 63. ^M 00 |
| BREADTH (MLD.) | 11. ^M 80 |
| DEPTH (MLD.) | 5. ^M 90 |
| DESIGNED DRAFT (MLD.) | 4. ^M 20 |



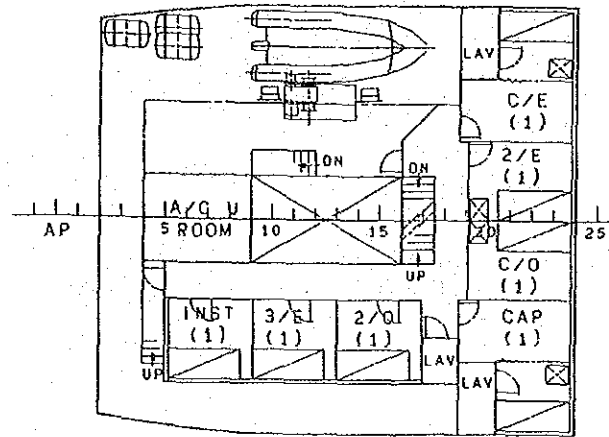
PLAN

SCALE 1/200

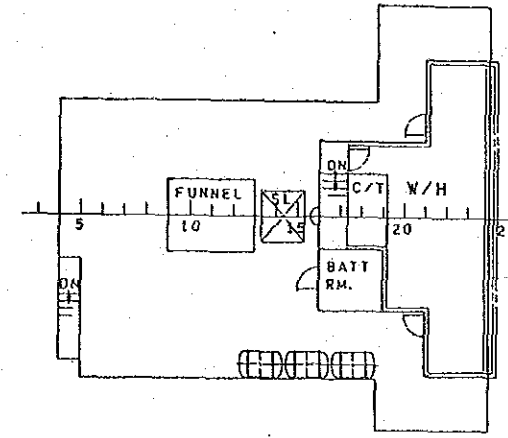
POOP DECK



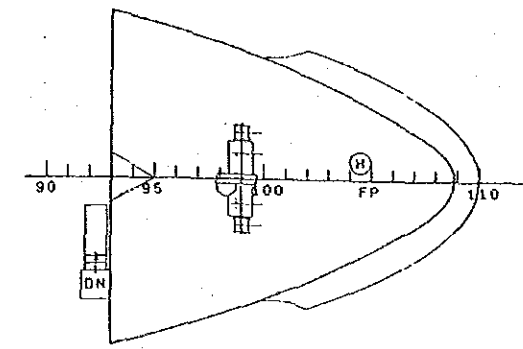
BOAT DECK



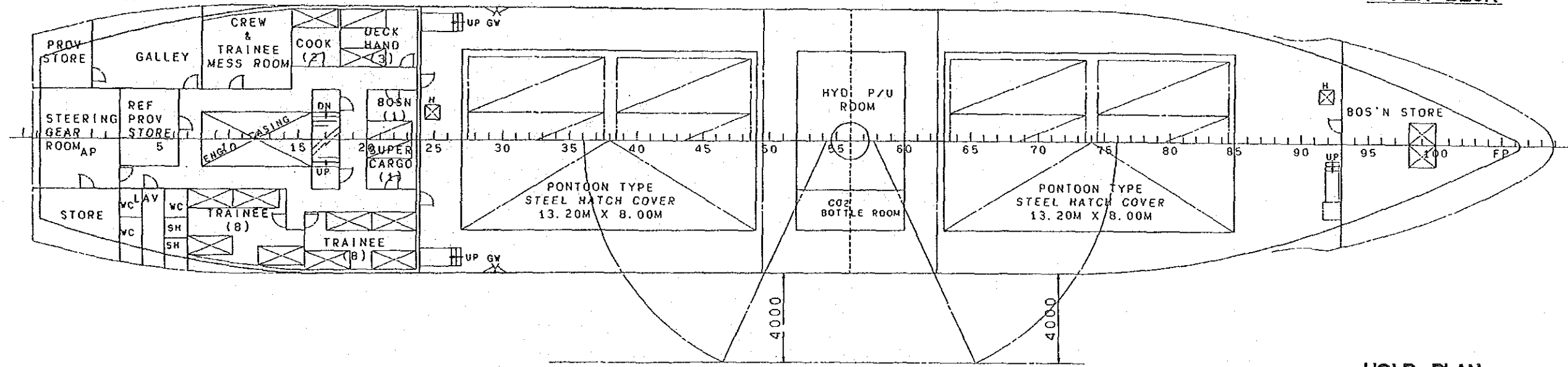
NAV. BRI. DECK



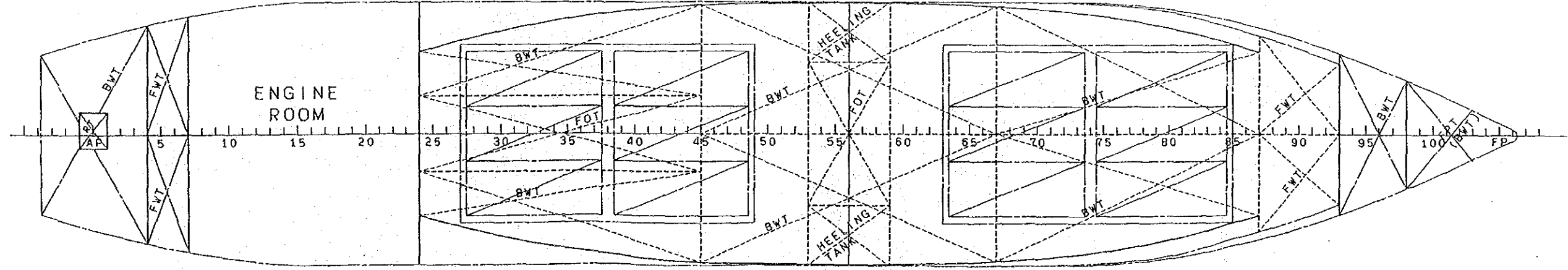
F'CLE DECK



UPPER DECK



HOLD PLAN



4.4 IMPLEMENTATION PLAN

4.4.1 Implementation Plan

After exchanging notes on this project between the two governments, the government of Kiribati and a selected consultant should discuss the implementation plan according to the basic design. Discussions shall include tender, contracts for construction, construction process, and ship transportation. Building of the vessel shall be done at a shipyard in Japan, which shall be decided by tender. During the construction period, a classification society and a consultant shall supervise the construction work, its completion within the scheduled time period, and delivering the vessel to the government of Kiribati. After completion, the vessel shall be brought to the Republic of Kiribati at the shipyard's responsibility.

4.4.2 Construction and Supervisory Plan

Under the conditions of Japan's Grant Aid system, the consultant shall organize a consistent project team concerning the basic design and administration aiming at satisfactory realization of the project. On the executive administration level, to ensure smooth progress the consultant must approve the construction drawings, attend the shop tests of the equipment, and dispatch engineers to the sea trial of the vessel.

4.4.3 Noteworthy Points for Execution

In the implementation of the project, the following items should be considered.

- (1) Because there is a weight limitation for vessels at the Fiji Marine shipyard where this vessel is expected to undergo future repairs, checking the lightness of the vessel is indispensable during construction.
- (2) Materials difficult to obtain in Kiribati should not be used. This is in consideration of maintenance and repairs after vessel delivery.

4.4.4 Procurement Plan for Containers

In this project, empty containers shall be supplied to the government of Kiribati. Inasmuch as they are to be loaded onto the vessel, metal fittings should be furnished at the shipyard. Therefore, to minimize transportation cost and to check the condition of loading containers onto the vessel, it is better to supply empty containers at the shipyard and load them before vessel departure from Japan.

The containers to be supplied are thirty three (33) general containers and six (6) refrigerating containers.

4.4.5 Implementation Schedule

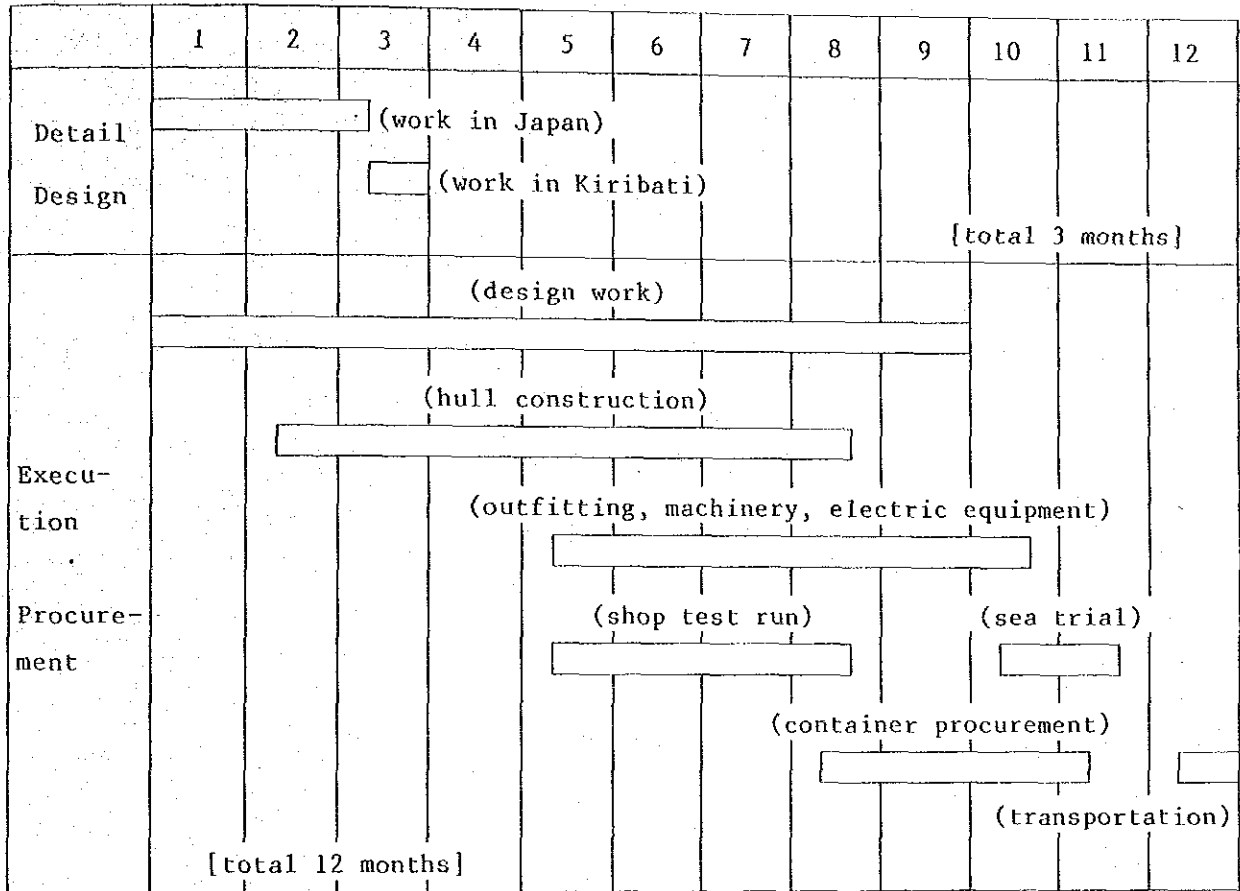
Because the shipbuilding for this project is to be executed at a shipyard in Japan, there are no responsibilities for construction work on the side of the Republic of Kiribati. Therefore, the responsibilities of the Japanese side encompass all facets, from compilation of the detail design to taking over of the vessel, which includes transportation of the vessel from Japan to Kiribati. The required times for these purposes are as follows.

Detail design: 3 months

Tendering: 2 months

Shipbuilding: 12 months

PROJECT IMPLEMENTATION



**CHAPTER 5 PROJECT EVALUATION
AND CONCLUSION**

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

5.1 PROJECT EVALUATION

Listed below are improvements expected to be obtained through implementation of the project, and the present situation.

| Present conditions and problems | Solutions provided by the project | Results and the degree of improvement expected |
|--|--|---|
| <p>1. The Moanaraoi is in a deteriorating condition and the repair requirements are multiplying. As a result, the number of nonoperational days and the costs of repairs have risen. The ship, moreover, has lost its international license.</p> | <p>* The multipurpose passenger-cargo vessel is to acquire a license for international voyaging. The machinery and materials to be installed on board must be durable enough and easy to maintain, manage, and handle.</p> | <p>* Repair expenses will be those only for regular repairs. The amount will be reduced from some A\$570,000 per year spent for the Moanaraoi to about A\$100,000 per year. Fewer repairs will be required, therefore a sailing schedule can be established, and thus the supply of goods and the lives of the people will be stabilized.</p> <p>* As a result of international licensing, inspectors of the licensing association will regularly check the vessel's safety, and its reliability will be upheld. Insurance companies, etc. will guarantee the hull and cargo, and the safety of lives and property will be ensured.</p> |
| <p>2 Under the present situation, the containerization of the shipping industry is advancing. In Kiribati, as well, the containerization of imported cargo has been progressing, but the infrastructure cannot cope with the process. Because the country must depend upon foreign bottoms for importing not only foodstuffs, but also sundries and general machinery, a stable supply of goods is difficult to realize.</p> | <p>* The vessel will be fitted with cargo holds capable of accommodating containers, with appropriate cargo gear that enables self-loading and unloading of cargo.</p> <p>* A set of 39 containers will be provided.</p> | <p>* The vessel can handle and accommodate 39 containers. The share of containerized cargo that was formerly lifted by foreign ships can be carried by the republic's own vessel. This will ensure a stable supply of goods and a stable life for the people.</p> <p>* The republic can conserve foreign currency by transporting cargo under its own flag.</p> |

| Present conditions and problems | Solutions provided by the project | Results and the degree of improvement expected |
|--|---|--|
| <p>3. To relieve the concentration of population, it is necessary to transport settlers from the Gilbert Islands to the northern Line Islands. After resettlement, the necessities of everyday life and materials and machinery for development will have to be transported. It is difficult to provide ships for these purposes because of the Moanaraoi's protracted layups.</p> | <p>* Inasmuch as the domestic sea area of Kiribati is great, the vessel will be certified as ocean going and will be built to withstand voyages of up to 5,000 miles.</p> <p>* The ship will provide space and conveniences for 50 deck passengers as well as the necessary life-saving facilities.</p> | <p>* On domestic voyages, the ship can carry 50 deck passengers. The fare will be very cheap in comparison with air transportation. Because the transportation of large baggage is also available, the new vessel will facilitate the movement of islanders. It will revitalize their lifestyle and ease living conditions in the outlying islands. This may result in altering the population concentration on one particular island.</p> |
| <p>4. On-board training for trainees of the MTC is required. The two ships owned by SCK, the Nei Momi and Nei Mataburo, will not be able to accommodate all the trainees.</p> | <p>* The vessel will provide quarters for the trainees.</p> | <p>* Sixteen trainees will be able to experience on-board training. Their seamanship will be improved and they can gain better opportunities to work on foreign ships, by which the country can expect to acquire more foreign currency. The vessel can also train seamen for Kiribati ships, and thus eliminate uncertainty in securing excellent seamen.</p> |

5.2 CONCLUSION AND PROPOSAL

As mentioned in 3.3.2, Plan of operation (2), the operational profits of this new vessel would not be sufficient to offset its depreciation.

As stated above, the completion of this project would bring about a wide range of advantages to the Kiribati economy and life-style. The new vessel would help to compensate for the paucity of transportation resulting from the insufficient service of the old vessel, the Moanaraoi. Therefore, it is considered appropriate to implement this project under Japan's Grant Aid system.

With regard to the operation and control of this program, the government of Kiribati has sufficient personnel and financial resources, so that there should be no problem with the program's execution. It is considered desirable, however, to review and to improve the program with regard to the following so as to obtain more positive operational results.

- 1) Because all materials and equipment for the vessel shall be imported into the Republic of Kiribati, the Shipping Corporation of Kiribati, as the key organization in charge of the maintenance and repair of ships, shall make maximum efforts towards the safekeeping and appropriate inventory control of required spare parts and materials. This is necessary to cope with emergency requirements and is essential for improvement of operational efficiency.
- 2) With the implementation of this project, containerization in Kiribati would advance significantly. For this purpose, the Shipping Corporation should carefully review the control of its own containers and establish a thoroughgoing control system.
- 3) The government of Kiribati should improve its port facilities and equipment step-by-step to cope with the containerization of its marine transportation.

APPENDIX

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 - 3) Japanese officials in Fiji
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 - (2) Survey Schedule
 - (3) List of Interlocutor
 - (4) Minutes of Discussions

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 - (2) Repair Facilities of Ship
 - 1) Batio Shipyard Ltd.
 - 2) Fiji Marine Shipyard
 - (3) Plan for Settlement in Northern line Islands
 - (4) Pictures

1. THE 1ST SURVEY TEAM (Survey of Basic design)

(1) MEMBER LIST OF SURVEY TEAM

The member of the Study Team are as follows.

| | |
|----------------------|--|
| Mr. Minoru Kitahara | Team Leader Deputy Director Ship Machinery Industries Division Maritime Technology and Safety Bureau Ministry of Transport |
| Mr. Yuki Aratsu | Project Coordinator Grant Aid Study & Design Department Japan International Cooperation Agency (JICA) |
| Mr. Nobuo Tomita | Naval Architect (Hull) Overseas Shipbuilding Cooperation Centre |
| Capt. Koichi Tamura | Operation Planner The Maritime International Cooperation Center of Japan |
| Mr. Yasuo Oe | Mechanical Engineer Overseas Shipbuilding Cooperation Centre |
| Mr. Hiroshi Akiyoshi | Naval Architect(Outfitting) Overseas Shipbuilding Cooperation Centre |
| Mr. Akio Kimura* | Naval Architect (Cost estimation) Overseas Shipbuilding Cooperation Centre |

(*)Mr. A. Kimura did not participate in the field survey.

(2) SURVEY SCHEDULE

| | | | | |
|-----|--------|------|--|---|
| 1. | Dec. 4 | Tue. | Lv. Japan | |
| 2. | 5 | Wed. | Av. Sydney, Lv. Sydney, Av. Nauru | |
| 3. | 6 | Thu. | Lv. Nauru; Av. Tarawa | |
| | | | Courtesy call, Ministry of Foreign Affairs of Kiribati, Ministry of Transport & Communications of Kiribati | |
| 4. | 7 | Fri. | Discussion with the Ministry of Transport & Communications of Kiribati | |
| 5. | 8 | Sat. | Observe cargo handling at container terminal of Betio port | |
| 6. | 9 | Sun. | Observe M/V NEI MATABURO | |
| 7. | 10 | Mon. | Discussion with the Ministry of Transport & Communications and Shipping Corporation of Kiribati (SCK) | |
| 8. | 11 | Tue. | Discussion with SCK and discussion with the Ministry of Home Affairs and Decentralisation | |
| 9. | 12 | Wed. | Observe Betio Shipyard Ltd. Discussion with SCK | |
| 10. | 13 | Thu. | Signing of the Minutes of Discussions Observe Marine Training Centre | |
| 11. | 14 | Fri. | Messrs. Kitahara, Aratsu and Tamura | Messrs. Tomita, Oe and Akiyoshi |
| | | | Lv. Tarawa, Av. Nadi | Discussion with SCK and Betio Shipyard Ltd. |
| 12. | 15 | Sat. | Visit to the EOJ and JICA of Fiji office | Meeting of mission member |
| 13. | 16 | Sun. | Lv. Nadi, Av. Japan | Meeting of mission member |
| 14. | 17 | Mon. | Discussion of the technical matters with SCK | |
| 15. | 18 | Tue. | | |
| 16. | 19 | Wed. | | |
| 17. | 20 | Thu. | | |
| 18. | 21 | Fri. | Lv. Tarawa, Av. Nadi | |
| 19. | 22 | Sat. | Mr. Oe | Messrs. Tomita and Akiyoshi |
| | | | Lv. Nadi Av. Japan | Lv. Nadi, Av. Suva Observe slipways |
| 20. | 23 | Sun. | Meeting of mission member | |
| 21. | 24 | Mon. | Observe The Fiji Marine Shipyard & Slipways, Visit to JICA of Fiji | |
| 22. | 25 | Tue. | Lv. Suva, Av. Sydney | |
| 23. | 26 | Wed. | Lv. Sydney, Av. Japan | |

(3) LIST OF INTERLOCUTOR

1) Government officials of Kiribati

MINISTRY OF TRANSPORT AND COMMUNICATIONS

| | |
|------------------------|----------------------------|
| Hon. Uera Rabaua | Minister |
| Mr. Meita Beiabure | Secretary |
| Mr. Rubetake Taburuea | Senior Assistant Secretary |
| Capt. Beiaiti Highland | Marine Superintendent |
| Miss Gertie Reiher | PA Secretary |

SHIPPING CORPORATION OF KIRIBATI

| | |
|-------------------------|----------------------------|
| Capt. Tabea Riwata | General Manager |
| Mr. Rekenibai Tawita | Financial Controller |
| Mr. Baikarawa Manikauen | Acting Engineering Manager |

MINISTRY OF HOME AFFAIRES AND DECENTRALISATION

| | |
|--------------------------------|--------------------------------|
| Mr. Nakibae Tenatabo | Secretary |
| Mr. Francis Ngalu | Ag. Senior Assistant Secretary |
| Mrs. Bintongo Even Tonganibeia | Assistant Secretary |

MINISTRY OF FINANCE AND ECONOMIC PLANNING

| | |
|--------------------|-------------------|
| Mr. Baraniko Baaro | Secretary |
| Miss Reina Timau | Project Economist |

MINISTRY OF FOREIGN AFFAIRES

| | |
|---------------------|----------------------------|
| Mrs. Margaret Baaro | Senior Assistant Secretary |
|---------------------|----------------------------|

MARINE TRAINING CENTRE

| | |
|------------------------|----------------|
| Capt. Hans J. Fockenga | Superintendent |
|------------------------|----------------|

BETIO SHIPYARD LTD.

| | |
|------------------|----------------------|
| Mr. Ioakim Tooma | General Manager |
| Miss Ma Hla Aya | Financial Controller |

2) Fiji

THE FIJI MARINE SHIPYARD & SLIPWAYS

| | |
|-------------------------|---------------------------------|
| Mr. Apenisa Naigulevu | Shipyards Manager |
| Mr. Sevuloni Kasanibuli | Senior Technical Assistant |
| Mr. Susumu Hasegawa | Shipyards Advisor (JICA Expert) |

3) Japanese officials in Fiji

Embassy of Japan

Mr. Tomoki Nitta

Second Secretary (AID)

Mr. Takeshi Tanabe

Third Attache

Japan International Cooperation Agency, Fiji Office

Mr. Yoshio Yoshida

Resident Representative

Mr. Syunichi Mizuochi

Assistant Resident Representative

(4) MINUTES OF DISCUSSIONS

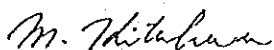
MINUTES OF DISCUSSIONS
ON
THE PROJECT
FOR
CONSTRUCTION OF MULTI-PURPOSE CARGO VESSEL
IN
THE REPUBLIC OF KIRIBATI

In response to the request of the Government of the Republic of Kiribati, the Government of Japan decided to conduct a basic design study on the Project for Construction of Multi-purpose Cargo Vessel (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA), JICA sent to the Republic of Kiribati the study team headed by Mr. Minoru KITAHARA, Deputy Director, Ship Machinery Industries Division, Maritime Technology and Safety Bureau, Ministry of Transport, from December 4th to December 26th, 1990.

The team had a series of discussions on the Project with the officials concerned of the Government of Kiribati and conducted a field survey.

As a result of the study and discussions, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Tarawa, December 13th, 1990



Mr. Minoru KITAHARA
Team Leader
Basic Design Study Team
JICA



Mr. Meita Beibure
Secretary
Ministry of Transport
and Communications
Republic of Kiribati



Capt. Tabea Riwata
General Manager
Shipping Corporation of Kiribati

1. TITLE OF THE PROJECT

The title of the Project is the "Project for Construction of Multi-purpose Cargo Vessel".

2. OBJECTIVE OF THE PROJECT

The objective of the Project is to construct a Multi-purpose Cargo Vessel (the Vessel) to maintain and meet anticipated demands for domestic transportation of both cargo and passengers.

3. EXECUTING ORGANIZATION

Ministry of Transport and Communications of Kiribati will be responsible for the administration of the Project and the Shipping Corporation of Kiribati will be the executing agency of the operation of the Vessel.

4. PROPOSED HOME PORT

The proposed main home port of the Vessel is Tarawa.

5. SHIPPING OPERATION PLAN

The shipping operation plan of the Vessel is described in Annex 1.

6. REQUEST BY THE GOVERNMENT OF KIRIBATI

The request made by the Government of Kiribati on the outline specification of the Vessel is shown in Annex 2.

The Japanese study team will convey to the Government of Japan the request of the Government of Kiribati that the former take necessary measures to cooperate in implementing the Project and provide the Vessel within the scope of Japan's Grant Aid Program.

7. SYSTEM OF JAPAN'S GRANT AID PROGRAM

The Government of Kiribati has understood the system of Japan's Grant Aid as explained by the team, which includes a principal for use of a Japanese consulting firm and a Japanese contractor and/or firm to be used for the implementation of the Project.

8. MEASURES TO BE TAKEN BY THE GOVERNMENT OF KIRIBATI

Provided that the Grant Aid by the government of Japan is extended to the Project, the Government of Kiribati will take the necessary measures listed in Annex 3.

[Handwritten initials]
[Handwritten initials]
[Handwritten initials]

Annex 1 SHIPPING OPERATION PLAN OF THE VESSEL

| NAME OF ROUTE | ORIGIN | DESTINATION | VOYAGE DURATION(DAYS) | VOYAGE TIME/YEAR | TOTAL VOYAGE |
|----------------|--------|---|-----------------------|-----------------------|--------------|
| Trw/Linnix | Trw | Line/Phoenix | 26 | Voyage Every 6 weeks | 8 |
| Gilbert Relief | " | Southern) Gilberts) | 20 | Voyage Every 13 weeks | 2) |
| " | " | Central &) Northern) Gilberts) | 20 | " | 2) |
| Fiji Runs | " | Fiji | 20 | " | 2 |

VR *ms*

Annex 2 OUTLINE SPECIFICATION OF THE VESSEL

Some particulars may be changed in accordance with the Grant Aid Scheme of Japan's Economic Cooperation.

1. TYPE OF VESSEL

A vessel carrying breakbulk general cargo, container and deck passenger on inter-island voyage.

2. CLASS NIPPON KAIJL-KYOKAI (NK)
NS* MNS*

3. RULES

Rules and regulations of Government regarding Ships
International Load Line Convention, 1966
International Convention for the Safety of Life at Sea, 1974
(In applying the SOLAS, the vessel shall be considered as a cargo ship)
International Telecommunication Radio Regulations
International Regulation for Preventing Collision at Sea, 1972
International Convention for Preventing of Pollution from Ships, 1973
including PROTOCOL 1978
International Convention on Tonnage of Ships, 1969

4. PRINCIPAL DIMENSION

| | |
|-------------------------------|-------------|
| Length between perpendiculars | abt. 63.00m |
| Breadth moulded | abt. 11.80m |
| Depth moulded | abt. 5.90m |
| Designed draft moulded | abt. 4.20m |

5. MAIN ENGINE

Diesel engine 1 set

6. ENDURANCE

abt. 5,000n.m. at service speed of 10 knots

7. COMPLEMENT

| | |
|------------------------------|-------------|
| Crew members | 13 persons |
| Seamen cadets and instructor | 17 " |
| Saloon passenger | 6 " |
| Deck passenger | <u>50</u> " |
| | 86 " |

8. CARGO HANDLING GEAR

Appropriate cargo handling equipment shall be provided on the main deck.

9. EMPTY CONTAINERS

One set of empty containers including reefer containers shall be provided.

VP
M2

Annex 3 NECESSARY MEASURES TAKEN BY KIRIBATI

1. To provide data and information necessary for the design during implementation of Project.
2. To ensure prompt customs clearance of the Vessel at the port of Kiribati
3. To exempt any equipment, materials and supplies brought into and/or purchased in Kiribati in connection with the performance of the works from any tax, duties and levies which are imposed in Kiribati.
4. To exempt Japanese nationals engaged in the Project from custom duties, internal taxes and other fiscal levies which may be imposed in Kiribati with respect to the supply of the materials and services under the verified contracts.
5. To accord Japanese nationals whose services may be required in connection with the supply of materials and the services under the verified contract such facilities as may be necessary for their entry and stay therein for the performance of their work.
6. To bear commissions to the Japanese foreign exchange bank for the banking services based on the Banking Arrangements, in accordance with Japan's Grant Aid procedure.
7. To bear all expenses, other than those to be borne by the Grant Aid, necessary in connection with the implementation of the Project.
8. To ensure the necessary budget and personnel for proper and effective operation and maintenance of the Vessel provided under the Grant Aid.

Y.P. *DS*
m-x

2. THE 2ND SURVEY TEAM (Confirmation of Draft Final Report)

(1) MEMBER LIST OF SURVEY TEAM

The member of the Study Team are as follows.

| | |
|----------------------|--|
| Mr. Toshisuke Fujita | Team Leader Director of Nuclear Technology office Maritime Technology and Safety Bureau Ministry of Transport |
| Mr. Takahiro Ikari | Project Coordinator Grant Aid Study Division Economic Cooperation Bureau Ministry of Foreign Affairs |
| Mr. Nobuo Tomita | Naval Architect (Hull) Overseas Shipbuilding Cooperation Centre |
| Mr. Hiroshi Akiyoshi | Naval Architect (Outfitting) Overseas Shipbuilding Cooperation Centre |

(2) SURVEY SCHEDULE

| | | | | |
|----|------|----|------|--|
| 1 | Apr. | 2 | Tue. | Lv. Japan |
| 2 | | 3 | Wed. | Av. Sydney, Lv Sydney, Av. Nauru |
| 3 | | 4 | Thu. | Lv. Nauru, Av Tarawa Courtesy call Ministry of Transport & Communications of Kiribati |
| 4 | | 5 | Fri. | Discussion with the Ministry of Transport & Communications of Kiribati, Observe Betio shipyard Ltd, Betio port, Container terminal. Courtesy call, Ministry of Foreign Affaires of Kiribati. |
| 5 | | 6 | Sat. | Meating of mission member |
| 6 | | 7 | Sun. | Observe Condition of the seashore |
| 7 | | 8 | Man. | Discussion with the Ministry of Transport & Communications and shipping Corporation of Kiribati (SCK) |
| 8 | | 9 | Tue. | Discussion with SCK, Observe Marine Training Centre |
| 9 | | 10 | Wed. | Courtesy call and Discussion with Ministry of Finance, Signing of the Minutes of Discussions |
| 10 | | 11 | Thu. | Lv. Tarawa Av. Suva |
| 11 | | 12 | Fri. | Visit to the EOJ and JICA of Fiji office Observe the Fiji Marine Shipyard & Slipways |
| 12 | | 13 | Sat. | Lv. Suva, Av. Nadi |
| 13 | | 14 | Sun. | Lv. Nadi, Av. Japan |

(3) LIST OF INTERLOCUTOR

MINISTRY OF TRANSPORT AND COMMUNICATIONS

| | |
|------------------------|----------------------------|
| Hon. Uera Rabaua | Minister |
| Mr. Meita Beiabure | Secretray |
| Mr. Rubetake Taburuea | Senior Assistant Secretary |
| Capt. Beiaiti Highland | Marine Superintendent |

SHIPPING CORPORATION OF KIRIBATI

| | |
|-------------------------|----------------------------|
| Capt. Tabea Riwata | General Manager |
| Mr. Rekenibai Tawita | Financial Cxontroller |
| Mr. Baikarawa Manikauen | Acting Engineering manager |

MINISTRY OF FINANCE AND ECONOMIC PLANNING

| | |
|--------------------|-----------|
| Mr. Baraniko Baaro | Secretary |
|--------------------|-----------|

MINISTRY OF FOREIGN AFFAIRES

| | |
|---------------------|----------------------------|
| Mrs. Margaret Baaro | Senior Assistant Secretary |
|---------------------|----------------------------|

MARINE TRAINING CENTER

| | |
|------------------------|----------------|
| Capt. Hans J. Fockenga | Superintendent |
|------------------------|----------------|

BETIO SHIPYARD LTD.

| | |
|------------------|-----------------|
| Mr. Ioakim Tooma | General manager |
|------------------|-----------------|

EMBASSY OF JAPAN

| | |
|----------------------|---|
| Mr. Yasao Hori | Ambassador Extraordinary and Plenipotentiary |
| Mr. Satoshi Nakajima | Second Secretary |

JAPAN INTERNATIONAL COOPERATION AGENCY, FIJI OFFICE

| | |
|-----------------------|-----------------------------------|
| Mr. Hideaki Ito | Resident Representative |
| Mr. Syunichi Mizuochi | Assistant resident Representative |

THE FIJI MARINE SHIPYARD & SLIPWAYS

| | |
|-------------------------|----------------------------|
| Mr. Apenisa naigulevu | Shipyards Manager |
| Mr. Sevuloni Kasanibuli | Senior Technical Assistant |

(4) MINUTES OF DISCUSSIONS

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

In response to the request of the Government of the Republic of Kiribati on the Project for Construction of Multipurpose Cargo Vessel (hereinafter referred to as the "Project"), the Government of Japan decided to conduct a basic design study on the Project and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to the Republic of Kiribati the study team headed by Mr. Minoru Kitahara, Deputy Director, Ship Machinery Industries Division, Maritime Technology and Safety Bureau, Ministry of Transport, from December 4th to December 20th, 1990.

As a result of the study, JICA prepared a draft final report and dispatched a team headed by Mr. Toshisuke Fujita, Director of Nuclear Technology Office, Technology Division, Maritime Technology and Safety Bureau, Ministry of Transport, from April 2nd to April 14th, 1991.

Both parties had a series of discussions on the report and agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

The Team express its sincere thanks for the undertakings given to the Team by Kiribati side during the study period, and Kiribati side express its sincere thanks for technical cooperation made by JICA to execute the Basic Design Study.

April 10th, 1991

TARAWA

Toshisuke Fujita
Mr. Toshisuke Fujita
Leader
Basic Design Study Team
JICA

Meita Beibure
Mr. Meita Beibure
Secretary
Ministry of Transport and
Communications
Republic of Kiribati

Tabea Riwata
Capt. Tabea Riwata
General Manager
Shipping Corporation of Kiribati

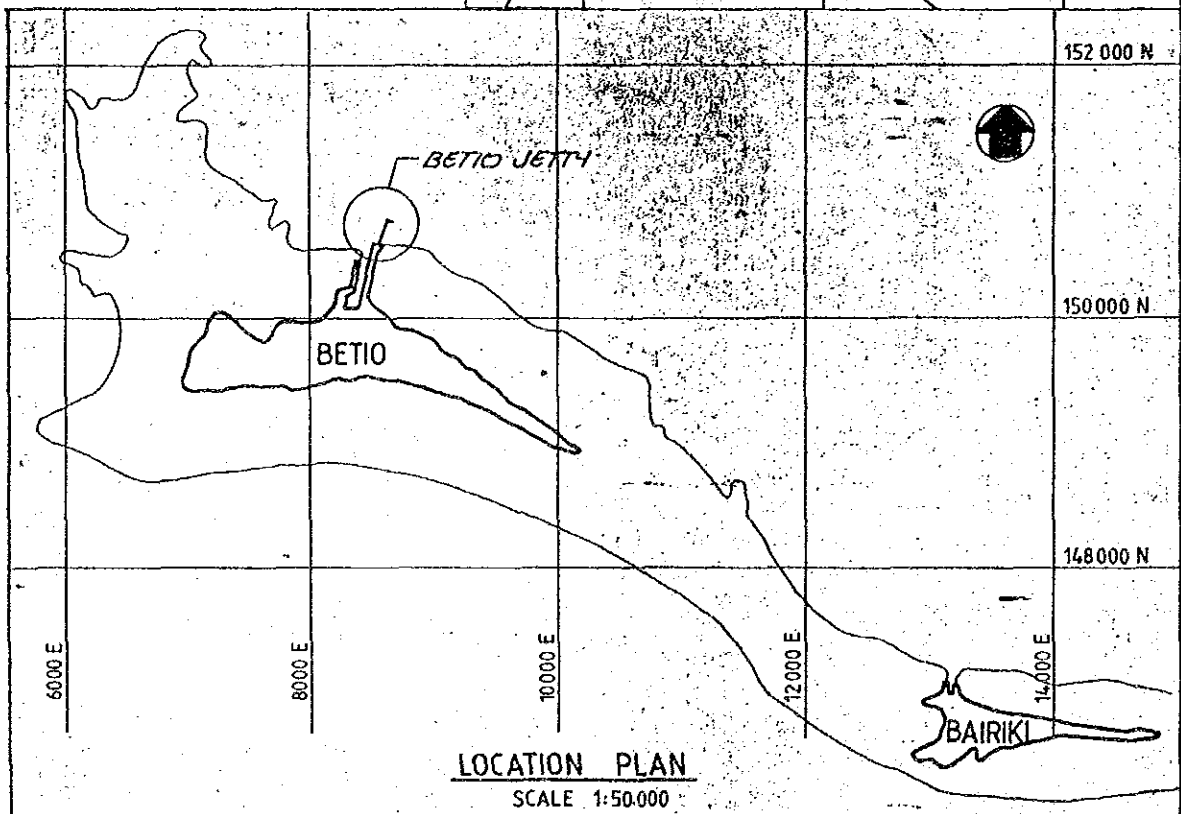
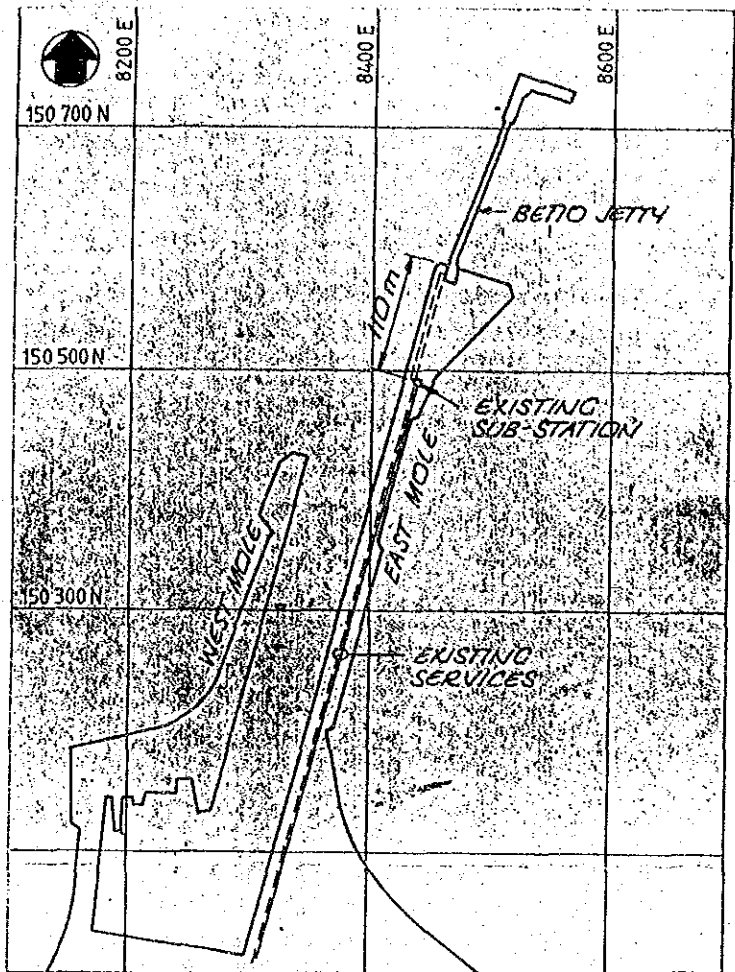
ATTACHMENT

1. The Kiribati side agreed in principle on the Basic Design proposed in the Draft Final Report with minor alterations which will be incorporated in the Final Report.
2. The Government of Kiribati will take necessary measures inclusive of preparation of budget for development and operation cost upon the execution of the Grant Aid Project extended by the Government of Japan.
3. The final report (10 copies in English) will be submitted to the Kiribati side by the end of June, 1991.
4. The Government of Kiribati will take necessary measures for proper and effective operation and maintenance of the vessel and equipments provided by the Project.
5. The Government of Kiribati requests to the JICA study team that one set of containers shall be thirty-nine (39).

T.F.
[Handwritten signature]

3. DATE OF KIRIBARI

(1) BETIO PORT



(2) REPAIR FACILITIES OF SHIP

1) BETIO SHIPYARD LTD.

(MAIN FACILITY AND MACHINE TOOLS)

(a) SLIPWAY

| | |
|------------------|--------------|
| Lifting capacity | 1 x 100 tons |
| Length of cradle | 20 meters |
| Width of cradle | 3.5 meters |
| Winch | 1 x 10 kw |

(b) MACHINE TOOLS

| | | |
|----------------------------------|-------------------------------|---|
| a. Welding machine | Area welder | 6 |
| | Mig machine | 2 |
| b. Plate roller | 1/8" to 1/4" x 3' | 1 |
| c. Power saw | | 1 |
| d. Sheet folder | | 1 |
| e. Guillotine | 1/8" x 3' | 1 |
| f. Lathe machine | Lathe length 5 meters | 1 |
| g. Lathe machine (small) | Lathe length 130mm | 1 |
| h. Milling/Drilling machine | | 1 |
| i. Sandblaster | | 2 |
| j. Water blaster | | 2 |
| h. Sewing machine for sail maker | | 2 |
| l. RIP Saw | Max. blade 24" | 1 |
| m. Planing machine | | 1 |
| n. Air compressor | Max. discharge pressure 7 bar | 3 |
| p. Crane truck | Capacity 2 tons | 1 |

2) FIJI MARINE SHIPYARD

(MAIN FACILITY AND MACHINE TOOLS)

(a) FACILITY

(i) Marine shipway

| No. | Capacity | Length | Quantity |
|-----|------------|--------|----------|
| 1 | 1,000 tons | 80m | 1 |
| 2 | 500 tons | 62m | 1 |
| 3 | 200 tons | 53m | 1 |

(ii) Repair wharf

| | |
|-----------------------|------------------------------------|
| Electric power supply | Length 55m |
| | 240v x 50HZ (3 phase) 60A x 5 sets |

(b) MACHINE TOOLS

| <u>Name of machine</u> | <u>Length</u> | <u>Dia.</u> | <u>Quantity</u> |
|---------------------------|---------------|-------------|-----------------|
| a. Lathe | 30' | 50" | 1 |
| b. Do. | 20' | 24" | 1 |
| c. Do. | 12' | 16" | 1 |
| d. Do. | 10' | 25" | 3 |
| e. Do | 6' | 10" | 1 |
| f. Fo. | 6' | 6" | 1 |
| g. Do. | 4' | 8" | 1 |
| h. Universal centre lathe | 8' (Height) | 8' | 1 |
| i. Milling machine | 5' | 2' | 2 |
| j. Drilling machine | - | 4" | 1 |

SUVA PUBLIC SLIPWAYS



Naval base

Work shed

Power supply connection
240 v 50 Hz
3 phase
4 wire
60 A max.

58 m

Gate house

500 ton Slip

62 m

1000 ton Slip

80 m

53 m

200 ton Slip

63 m

55 m

5

10

(3) PLAN FOR SETTLEMENT IN NORTHERN LINE ISLANDS

Population of each island and applicants for settlement

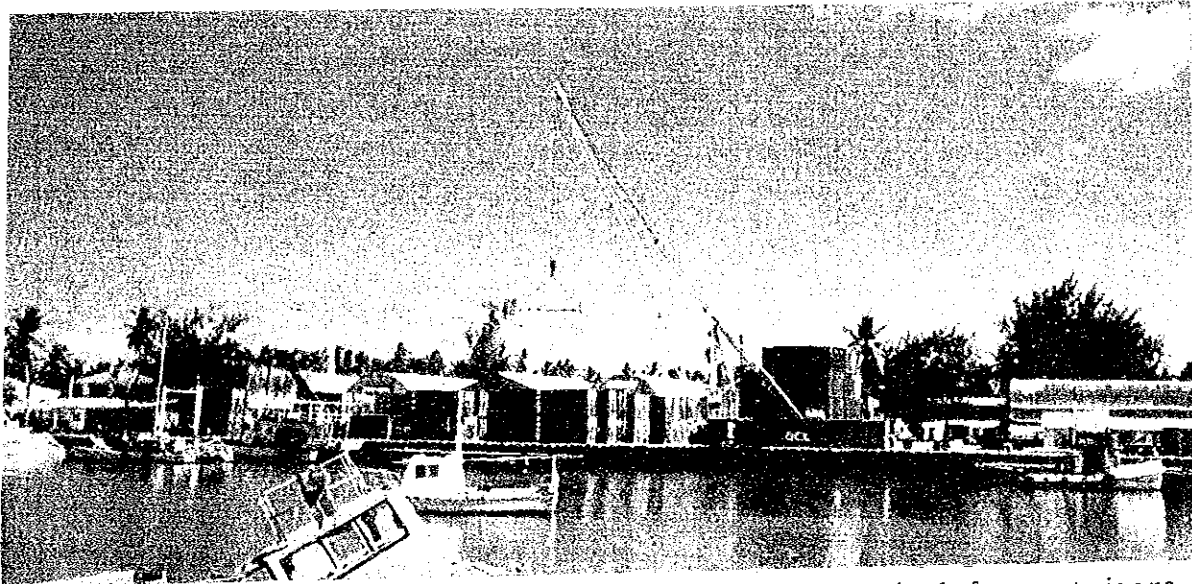
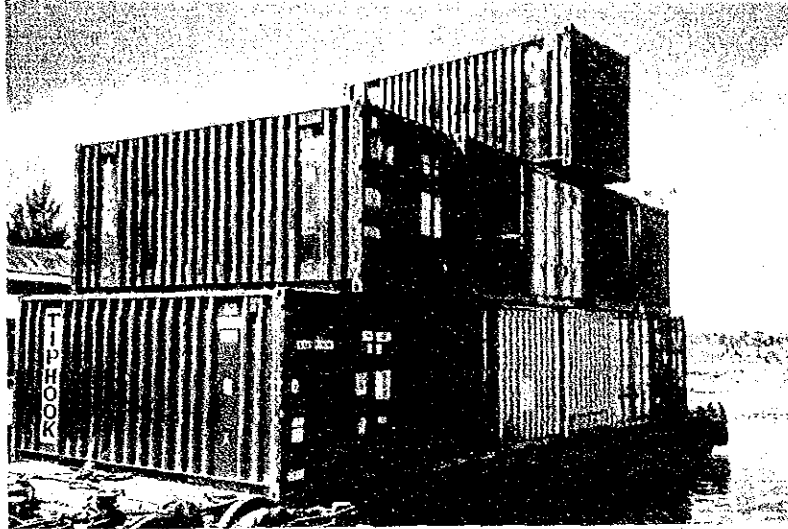
April 12, 1990

| NAME OF ISLAND | No. of applicants for settlement | Population at 1990 | Remarks |
|----------------|-------------------------------------|--------------------|---------|
| MAKIN | 238 | 1,761 | |
| BUTARITARI | 421 | 3,774 | |
| MARAKEI | 352 | 2,866 | |
| ABAIANG | 441 | 5,224 | |
| NORTH TARAWA | 224 | 3,638 | |
| SOUTH TARAWA | 242 | 25,343 | |
| MAIANA | 260 | 2,200 | |
| ABEMAMA | 164 | 3,292 | |
| KURIA | 132 | 990 | |
| ARANUKA | 133 | 1,003 | |
| NONOUTI | 308 | 2,801 | |
| NORTH TABITEUA | 333 | 4,531 | |
| SOUTH TABITEUA | 165 | | |
| BERU | 275 | 2,905 | |
| NIKUNAU | 229 | 1,974 | |
| ONOTAO | 255 | 2,111 | |
| TAMANA | 265 | 1,370 | |
| ARORAE | 283 | 1,443 | |
| Total | 4,720 | 67,226 | |

SOURCE: Ministry of Home Affairs and
Decentralization,
Ministry of Finance

(4) Pictures

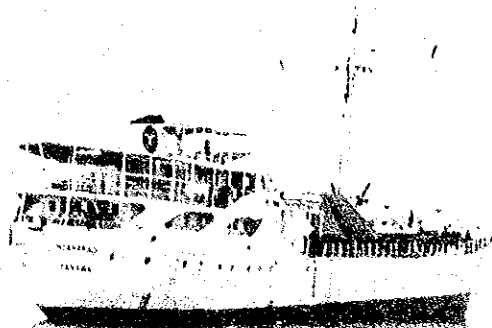
Barge for containers



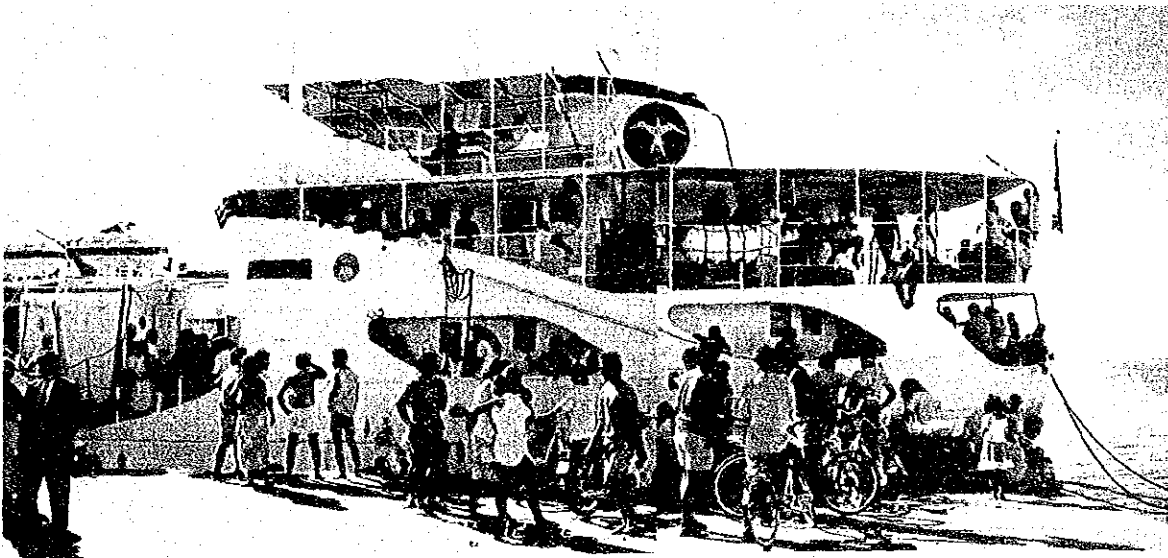
Terminal for containers



Jetty of the Betio port



Moanaraoi



Deck passenger of Moanaraoi



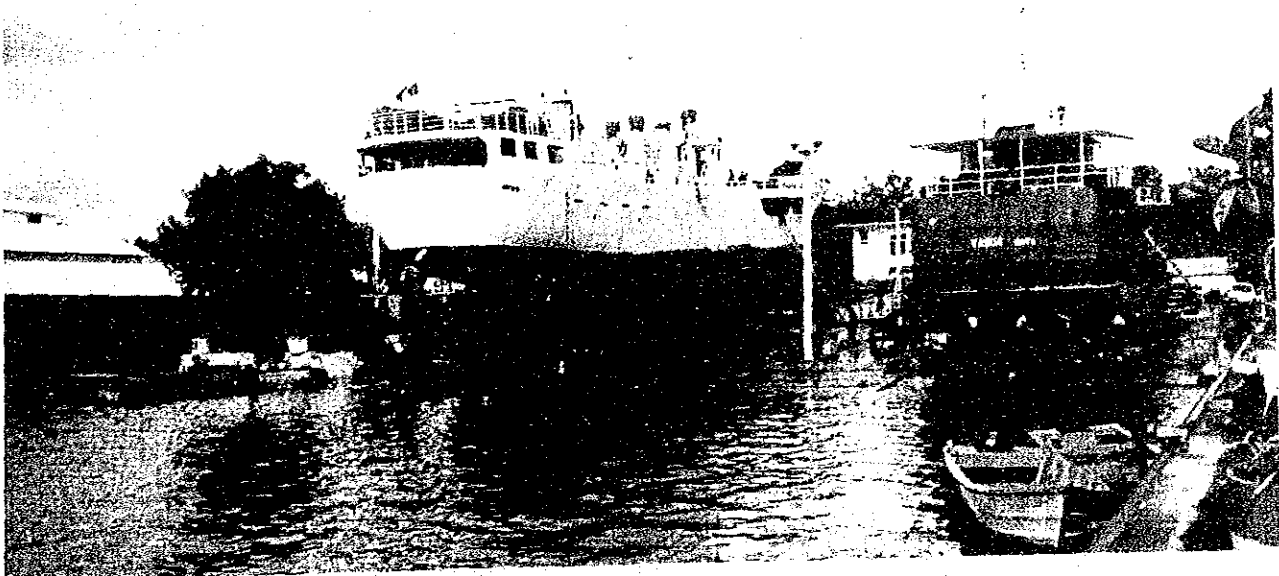
Nei Mataburo (Japanese grant aid in 1983)



Betio shipyard



Store for Copra at ABAIANG island



Suva public slipways

JICA