MITSUBISHI CORPORATION

6-3, MARUNOUCHI 2-CHOME, CHIYODA-KU, TOKYO, JAPAN

DATE: FEB 2, 1996	OUR REF NO. MF-B 602 NO OF PAGES: 1/24
FAX TO: 886-2-758-6273 NATIONAL SHIPPING AGENCY CORPORATION(NSAC) ATTN: MR. MICHAEL L.Y. PAN CHAIRMAN CC: MC/TPE(MV-6)/HKG(MAC)	
FROM : MITSUBISHI CORPORATION, TOKYO, JAPAN SHIP & INDUSTRIAL PROJECT DEPT. (MF-B) J. YANAGAWA PHONE NO. 81-3-3210-4460, FAX 81-3-3210-4494/4473	

DEAR MR. PAN,

RE : HAKODATE 24,200 DWT BULK CARRIER

WE ARE PLEASED TO INTRODUCE TO YOU HEREBY HAKODATE 24,200 DWT BC FOR YOUR PERUSAL. AS YOU KNOW, HAKODATE HAS A VERY CLOSE RELATION WITH US AND HAS BEEN BUILDING MORE THAN TWENTY VESSELS TROUGH US FOR NYK/MOL AND OTHER HONG KONG OWNERS DURING THE PAST 5 YEARS.

IN THIS OPPORTUNITY, YOU ARE KINDLY REQUESTED TO ADVISE US OF YOUR INTEREST IN THIS TYPE OF SHIP WITH SOME CHARTER ARRANGEMENT.

1. TYPE OF SHIP : 24,200 MTDW BULK CARRIER (D.NO.N94-810)
2. BUILDER : HAKODATE
3. DELIVERY : 1997/SEPTEMBER OR DECEMBER (PRIOR SALE)
4. PRICE IDEA : J.YEN 1,980,000,000.-/SHIP

IF YOU KINDLY ADVISE US OF YOUR IDEA OF TIME CHARTER REQUIREMENTS(PERIOD/RATE ETC), WE WOULD LIKE TO TRY OUR BEST TO FIND SUITABLE T/C ARREICATED.

YOUR KIND ATTENTION TO THE ABOVE IS MUCH APPRECIATED.

KINDEST REGARDS

Jun Yanagawa

OUTLINE SPECIFICATIONS

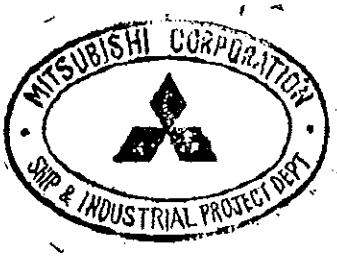
OF

A 24,200 M.T.D.W. TYPE BULK CARRIER

DECEMBER, 1994

THE HAKODATE DOCK CO., LTD.

TOKYO, JAPAN



Design No. N94-810
Drawing No. G-1/D-0

I. GENERAL

1. Type and Classification

Type of vessel	Well decker with machinery and accommodation space aft having top side tanks and hopper side tanks
Kinds of cargoes	Grain in bulk, coal, log, steel product or cargoes which constitute a low fire risk
Service area	Ocean going
No. of deck	One
Flag	Panamanian flag
Classification	Nippon Kaiji Kyokai (NK) NS* "Bulk Carrier" MNS*
Rules & Regulations	International Convention on Load Lines, 1966
	International Convention for the Safety of Life at Sea, 1974, Protocol, 1978 and Amendments, 1981, 1983 and 1988 to 1991
	International Tonnage Regulation, 1969
	Panamanian Maritime Laws and Regulations
	Panama and Suez Canal Navigation Rules
	International Tele-Communication Convention and Radio Regulations, 1982
	USCG Pollution Prevention Regulation for Foreign Vessel
	Cargo and Cargo Handling Equipment and Safety Measures (Australian D.O.T.)
	International Convention for the Prevention of Pollution from Ships, 1973 and Protocol, 1978 (Annex I and V)
	Convention of the International Regulation for Preventing Collision at Sea, 1972 and amendments, 1981
	International Code for the Safety Carriage of Grain in Bulk (IMO Resolution MSC. 23 (59))
	Harbour Rules concerning Cargo Gear (Australia, Canada, India, Pakistan and New Zealand)
	Canadian Code of Safe Practice for Ships Carrying Timber Deck Cargoes

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2. General Arrangement

The vessel to be divided by 6 watertight bulkheads into 7 compartments.

1) Fore peak tank and boatswain store

2) 4 - cargo holds,

4 - pair top side tanks only for water ballast,

4 - pair double bottom and bilge hopper tanks for water ballast and

4 - double bottom tanks for fuel oil or diesel oil

3) Engine room and

5 - tier accommodation space

4) Aft peak tank and steering gear room

3. Owner's Supply

The following articles and equipments to be supplied by the Owner's account.
Custom fees for them to be for the Owner's account.

- All hoses, etc., other than those required by the rules
- Steel wires, ropes and hawsers for mooring in excess of the requirement of the Classification Society
- Deck, engine and cabin stores
- All bedding (blankets, sheets, covers, pillows etc.) excluding mattresses
- All napery (serviettes, table clothes, etc.)
- All cook's and steward's utensils (crockery, cutlery, silver-wares, earthenwares, glasses, pots, pans, etc.)
- All chandlery (soaps, lamp oil, etc.)
- All charts
- All books (hydrographical books, nautical almanacs, signal books, list of ship's name, etc.)
- Owner's flag
- Carpenter's tools
- All consumable stores
- All medicine and medical equipments
- Suez Canal searchlight
- Television set, Video tape recorder, Stereo set
- Loose fitting for log loading, such as wires, turnbuckles, wire nets, etc.

- Spare parts, navigation equipments, flags, etc., in excess of the requirements of the rules and regulations
- Lubricating oils, greases, and operating oils of all machineries and equipments

4. Dry Docking

Final dock not to be carried out.

Final coat of paint for outside shell to be applied before launching of the vessel.

5. Spare Parts and Tools

Spare parts and tools to be furnished in accordance with the requirements of the Classification Society and/or the recommendation of the manufacturer.

II HULL PART

1. Principal Dimensions

Length overall	abt.	157.20 M
Length between perpendiculars		149.99 M
Breadth, moulded		26.00 M
Depth, moulded		13.30 M
Designed draft, moulded		9.50 M
Summer draft, moulded	abt.	9.50 M
Timber summer draft, moulded	abt.	9.80 M

2. Tonnage and Capacity

Gross tonnage	abt.	14,800 T
Deadweight on summer draft, moulded	〃	24,200 M.T.
Cargo hold capacity, grain	〃	31,000 m³ (abt. 1,090,000 Cub.ft)
Cargo hold capacity, bale	〃	29,800 m³ (abt. 1,050,000 Cub.ft)

Grain : Stowage factor about 47 cub.ft/LT with about 800 M.T. of consumables, etc.

Log : Stanchion height ; No.1 hold 7.0 m
No.2 ～ 4 hold 7.5 m
Capacity ; 4,375,000 SCR basing on 375 cub.ft/1,000 SCR
Stowage factor ; To be subject to ship's intact and damage stability

Tank capacities : (100% capacity)

Fuel oil	abt.	1,000 m³
Diesel oil	〃	130 m³
Potable water	〃	140 m³
Fresh water	〃	140 m³
Ballast water	〃	8,000 m³

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3. Complement

Highest officer class	2
Senior officer class	2
Junior officer classs	5
Petty officer class	3
Rating class	9
Spare (junior officer class)	2
Do. (rating class) (2 persons/room)	2
Total	25

4. Speed and Cruising Range

Speed on designed draft at normal output of M/E (90% MCR) with 15% sea margin	abt. 14.2 knots
Fuel oil consumption of M/E at normal output (Based on fuel oil of 9,700 Kcal/kg lower calorific value)	abt. 20.2 MT/day
Endurance at service speed of 14.2 knots at fuel oil consumption of abt. 21.4 MT/day for main engine and generator engine	abt. 14,000 N. miles

5. Hull Construction

1) Higher-tensile steel (Yield stress 32 kg/mm²)

Deck, shell, tank top plate in hold, longitudinal members, etc. in accordance with Builder's practice

2) Structure

Upper deck, top side tanks, hopper side tanks and double bottom amidships	Longitudinal framing
Side shell in way of cargo holds	Transverse framing
Transverse bulkheads between cargo holds	Plain type

3) Inner bottom plate

In accordance with Class Rules for grab handling

4) Stem

Bulbous bow type

5) Stern frame

Inverted "G" type

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6. Strength Base

1) Cargo holds (grain loading)

(1) Homogeneous loading

(2) Nos.1, 3 and 4 cargo holds full (SF = 42 CF/LT) and
No.2 cargo hold slack

(3) Nos.1 and 3 cargo holds full (SF = 42 CF/LT) and
Nos.2 and 4 cargo holds empty

(4) Nos.2 and 4 cargo holds full (SF = 42 CF/LT) and
Nos.1 and 3 cargo holds empty

(5) No alternate loading

2) On tank top

(1) Uniform load : 11.2 t/m² (SF = 42 CF/LT)

(2) Steel coil loading : 15 MT x 2 tiers (coil width 1.5 m, wooden dunnage 3 rows)

3) On upper deck (excluding upper deck between hatches)

(1) Uniform load : 3.7 t/m²

4) On hatch cover

(1) Uniform load : No.1 hatch cover 2.28 t/ m²
No.2 ~ No.4 hatch covers 2.50 t/ m²

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7. Hatches

	Hatch size L(m) x B (m)
No.1 hatch	18.48 x 13.05
No.2 hatch	21.56 x 13.05
No.3 hatch	21.56 x 13.05
No.4 hatch	21.56 x 13.05

Hatch covers : Weathertight end folding type, operated by hydraulic cylinders and secured by quick acting cleats manually.

Four (4) sets of 400φ grain hole to be provided for each hold.

8/

8. Deck Machineries

Windlass	Electro-hydraulic	as windlass	17 t x 9 m/min. x 2 sets
		as mooring winch	10 t x 15 m/min. x 2 sets
Mooring winch	Electro-hydraulic		10 t x 15 m/min. x 2 sets
Deck crane	Electro-hydraulic		30.5 MT x 24 mR x 3 sets 30.5 MT x 22 mR x 1 set
		hoisting speed	abt. 18.5 m/min.
Steering gear	Electro-hydraulic		1-ram, 2-cylinder, 1 set (pump : 50% x 2 sets)

9. Fire Fighting Appliances and Fire Protection

Cargo space	Hydrants
Living quarters	Hydrants and portable fire extinguishers
Engine room	Fixed CO_2 fire extinguishing system, hydrants and portable fire extinguishers
Fire protection	III-C type
Emergency fire pump	Electric motor driven type x 1 set

10. Life Saving Apparatus

Life boat	2 - Totally enclosed type motor life boat of glass fiber reinforced plastic for 25 persons driven by diesel engine of water cooled type
Life raft	2 - for 25 persons 1 - for 6 persons

11. Ventilation

Cargo holds	Natural ventilation		
Living quarters	Air conditioning		
	Design condition		
		Summer	Winter
	Outside	32℃/70% R.H.	- 10℃
	Inside	27℃/50% R.H.	20℃/50% R.H.
Engine room	Mechanical ventilation		

12. Hull Outfittings

Bower anchor	:	Stockless type 6,000 kg x 2 sets
Anchor chain	:	Grade 3, 60 mm dia x 577.5 m length
Mooring rope	:	Polypropylene rope x 5 sets
Machinery and provision handling gear	:	1.5 tons jib type crane x 1 set
Accommodation ladder	:	Galvanized steel x 2 sets

13. Hull Piping

1) Ballast line for W.B.T. in double bottom and F.P.T.

Line	Two (2) main lines led in double bottom W.B.T.
Valve	Hydraulic butterfly valves operated manually from upper deck Angle valve with spindle operated from upper deck for F.P.T.
Pipe material in W.B.T.	STPG SCH 40 (Galva.)

2) Ballast line for top side tanks

Line	Filled from wash deck line and discharged overboard directly by gravity
Valve	Filling : Manually operated butterfly valves Discharge : Surface valve with spindle operated from upper deck

3) Bilge line for cargo holds

Line	Two (2) main lines led in double bottom W.B.T.
Valve	Hydraulic butterfly valves operated manually from upper deck

4) Fuel oil line for F.O.T. in double bottom

Line	Independent lines led in double bottom
Valve	Valves in engine room to be operated manually

5) Sanitary system

Aeration discharge type sewage treatment unit ····· 1 set

14. Accommodation

1) Crew's cabin

Highest officer class	:	Day room and bed room with private lavatory
Senior officer and Junior officer class	:	Single berth cabin with private lavatory
Petty officer and rating class	:	Single berth cabin
Rating's spare	:	Two tiers berth cabin

2) Public room and office

Officer's mess room, smoking room
Rating's mess room, smoking room
Ship's office
Tally office
Hospital

3) Commissary space

One (1) galley, one (1) pantry and two (2) laundries

4) Refrigerated provision chamber

Meat room, fish room, vegetable room and lobby
About 45 cub.m in total

5) Joiner bulkhead, lining and ceiling

Non-combustible board covered with polyester overlay for the passages.
Ceiling of passages not to be fitted.
Non-combustible board, chip board or plywood covered with polyester overlay for others.

6) Deck covering

Vinyl tile on deck composition for cabins of senior officer class and above, officer's mess room and smoking room.
Deck composition for cabins except the above, rating's mess room and smoking room, wheelhouse, ship's office, engine control room, tally office and passages.

7) Window and scuttle

Square window	Highest officer's class cabins and officer's mess rooom and smoking room
Round scuttle	Cabins and public rooms except the above

15. Painting and Cathodic Protection

1) Surface preparation

Structural steel surfaces which are painted to be coated with one (1) coat of the Builder's standard shop primer just after shot blasting.

2) Painting schedule

Abbreviations ;

A/F	: Anti-fouling paint	DP	: Deck paint
A/C	: Anti-corrosive paint	FP	: Finish paint
B/T	: Boot top paint	HB	: High-built type
T/S	: Topside paint	BC	: Binder coat
CR	: Chlorinated rubber paint	SP	: Self polishing (Tin-free type)
TE	: Tar epoxy paint		
PE	: Pure epoxy paint	NTE	: Non-tar epoxy paint
		ACV	: Anti-corrosive varnish

Shell outside	
Bottom (up to ballast water line)	TE A/C x 1, BC x 2, SP type A/F x 2 (two (2) years life)
Boot top	CR A/C (HB) x 2, CR B/T x 2
Top side	CR A/C (HB) x 2, CR T/S x 2
Exposed deck	CR A/C x 2, CR DP x 1
Outside of accommodation deck house and deck store	NTE x 1 (125 μ), CR FP x 1
Cargo hold inside	
Side wall and overhead	NTE x 1 (100 μ)
Tank top	Not painted
Water ballast tank	TE (HB) x 1 (200 μ)
Fresh water tank	PE x 2 (total 200 μ)
Fuel oil tank	ACV x 1

Other spaces not specified above to be painted with oleoresinous paint in accordance with the Builder's standard.

3) Cathodic protection

Aluminum anodes of two (2) years life to be fitted on stern part, rudder and sea chest in accordance with the Builder's standard.

III. MACHINERY PART

1. Main Engine

No.	1 set
Type	MITSUBISHI 6UEC45LA, uniflow scavenging, two stroke cycle, single acting, crosshead, reversible type, exhaust turbo-charged with air cooler, marine diesel engine
Output Max. continuous (MCR) Normal (90% MCR)	 5,298 KW (7,200 PS) x 158 RPM 4,788 KW (6,480 PS) x 152.5 RPM
Fuel oil consumption	123.5 g/ps·h + 3% (at 90% MCR), (based on diesel oil of lower calorific value of 10,200 Kcal/kg)
Fuel oil	Designed to burn fuel oil having viscosity of 380 cSt and below at 50℃ (equivalent to 3,500 sec. R.W. No.1 at 38℃) Diesel oil at cold starting and before finished with engine.

2. Shafting

No. of shaft line	1 set
Screw propeller	1 set 4 bladed solid, keyless type, nickel aluminum bronze
Stern tube	Oil bath white metal type with oil sealing (total: 5 seals)

Spare propeller and spare propeller shaft not to be furnished.

3. Steam Generating Plant

1) Auxiliary boiler

No.	1 set
Type	Vertical, forced draft, oil burning
Steam condition	6 kg/cm²G (working), saturation
Evaporation	Max. 1,000 kg/h

2) Exhaust gas economizer

No.	1 set
Type	Forced circulating type
Steam condition	6 kg/cm²G (working), saturation
Evaporation	800 kg/h (at 90% MCR of M/E and T/C suction air temp. of 25 ℃)

4. Electric Generator Engine

1) Main generator engine

No.	2 sets
Type	Four stroke, trunk piston type diesel engine
Output	600 PS x 720 RPM
Fuel oil	Heavy fuel oil of viscosity of 380 cSt and below at 50 ℃
	Diesel oil at cold starting, low load condition and before finished with engine

2) Emergency generator engine

No.	1 set
Type	Four stroke, trunk piston type diesel engine
Output	98 PS x 1,800 RPM
Fuel oil	Diesel oil

5. Auxiliary Machinery

The capacity of auxiliary machinery to be designed for the maximum continuous rating of main engine.

1) Cooling water system

Conventional S.W. cooling system to be provided.

1 - Cooling S.W. pump (M.D. centrifugal)
2 - Cooling F.W. pump (M.D. centrifugal)
1 - Auxiliary cooling S.W. pump (M.D. centrifugal)
1 - Air cond. cooling S.W. pump (M.D. centrifugal)
1 - Fresh water cooler (Shell & tube)
1 - Gene. engine fresh water cooler (Shell & tube)
1 - Air compressor fresh water cooler (Shell & tube)
1 - Main engine jacket pre-heater (Plate & fin)

2) Feed and drain system

2 - Feed water pump (M.D. centrifugal)
2 - Boiler water circulating pump (M.D. centrifugal)
1 - Auxiliary condenser (Shell & tube)
1 - Cascade and inspection tank

3) Fuel oil system

2 - Fuel oil booster pump (M.D. gear)
2 - Fuel oil circulating pump (M.D. gear)
1 - Gene. engine diesel oil supply pump (M.D. gear)
1 - Auxiliary boiler fuel oil circ. pump (M.D. gear)
1 - Fuel oil transfer pump (M.D. gear)
1 - Diesel oil transfer pump (M.D. gear)
2 - Fuel oil purifier (Self-cleaning, total discharge)
2 - Main & aux. engine fuel oil heater
(Pin tube, steam heating, 50% capacity each)
2 - Purifier fuel oil heater (Pin tube, steam heating)
1 - Main & gene. engine fuel oil viscosity control device (Air operated)

4) Lubricating oil system

2 - Lubricating oil pump (M.D. screw)
1 - Lubricating oil transfer pump (M.D. gear)
1 - Lubricating oil purifier (Self-cleaning, total discharge)
1 - Lubricating oil cooler (Shell & tube)
1 - Purifier lubricating oil heater (Pin tube, steam heating)

5) Compressed air system

2 - Main air compressor (M.D. two stage, F.W. cooled)
1 - Emergency air compressor (Manual driven)
2 - Main air reservoir (Cylindrical)
1 - Auxiliary air reservoir (Cylindrical)

6) Fire, bilge, ballast and general service system

1 - Fire, bilge & ballast pump (M.D. centrifugal with vacuum pump, 90/180 m^3/h)
1 - Ballast pump (M.D. centrifugal, 400 m^3/h)
1 - Fire & general service pump (M.D. centrifugal with vacuum pump, 90/180 m^3/h)
1 - Bilge pump (M.D. piston)
1 - Bilge separator (2 m^3/h, 15 PPM)
1 - Sludge pump (M.D. single screw)
1 - Bilge & ballast eductor

7) Fresh water service system

1 - F.W. generator (M/E jacket heating, 15 T/D)
1 - Fresh water pump (M.D. centrifugal)
1 - Potable water pump (M.D. centrifugal)
1 - Hot water circulating pump (M.D. centrifugal)
1 - Sterilizer (Ultra violet ray)
1 - Fresh water pressure tank
1 - Potable water pressure tank
1 - Hot water heater (Plate & fin)

8) Miscellaneous

1 - Lathe(Center span abt. 800mm)
1 - Drilling machine
1 - Grinder (Twin head, dry)
1 - Gas welder (1-Acety. and 2-oxy. bottles)
1 - Electric arc welder
1 - Air horn with heater and time controller
1 - Main engine crane (2 ton)
1 - Control room unit cooler (Packaged type)
1 - Waste oil incinerator (Sludge oil and solid waste burning, 200,000 Kcal/h)
2 - Engine room ventilating fan (Vertical axial, reversible)
1 - Purifier space exhaust fan (Vertical axial)
1 - Cold water fountain

6. Material

Materials for machinery, vessel, etc. except the undermentioned to be in accordance with the rule of the Classification Society and/or manufacturer's standard.

1) Centrifugal pump

Component	Fresh water	Sea water	Boiler water circulating
Casing	Cast iron	Bronze	Cast steel
Impeller	Phosphor bronze	Phosphor bronze	Stainless steel
Shaft	Stainless steel	Stainless steel	Stainless steel
Gland seal	Gland packing	Gland packing	Gland packing

2) Rotary Pump

Component	Gear type	Screw type
Casing	Cast iron	Cast iron
Gear	Carbon steel	—
Shaft	Carbon steel	—
Power rotor	—	Carbon steel
Idle rotor	—	Carbon steel or ductile cast iron
Gland seal	Gland packing	Mechanical seal

3) Heat exchanger (cooler)

Component	Material
Shell	Steel plate or steel pipe
Tube	Aluminum brass
Tube plate	Naval brass
Cover	Cast iron

4) Pipe

Service	Material
Cooling sea water	Seamless steel (sch. 40), galvanized
Cooling fresh water	Welded steel
Fire, bilge and ballast	Welded steel; galvanized
Compressed air (25 kg/cm²G)	Seamless steel (sch. 40), galvanized
Heating coil	Seamless steel (sch. 40)

Fuel oil	Welded steel
below 60 ℃ and 7kg/cm²G	Welded steel
over 60 ℃ and 7kg/cm²G	Seamless steel (sch. 40)
Other pipes	Welded or seamless steel depending on pressure and temperature

7. Automation and Remote Control

The machinery part to be designed as "Attended Engine Room".
In control room, main engine remote control equipment and centralized watching board to be installed.

The following controls to be provided.

1) Remote control of main engine from the control room

2) Automatic shut-down of main engine with alarm

3) Automatic shut-down of generator engines with alarm

4) Automatic combustion control of auxiliary boiler

5) Automatic starting and stopping of feed water pumps

6) Automatic and remote starting & stopping control of main air compressors

7) Automatic temperature control of fresh water & lub. oil for main and generator engines

8) Automatic viscosity control of fuel oil for main & generator engines

9) Automatic start of stand-by pump for main engine lub. oil pumps

10) Manual start and automatic operation of fuel oil and lub. oil purifiers

11) Automatic level control of fuel oil settling tank

12) Surplus steam from exhaust gas economizer to be automatically dumped to auxiliary condenser through dump valve.

13) Automatic starting & stopping control of fresh water pump and potable water pump

IV. ELECTRIC PART

1. Voltage and Wiring System

Item	Voltage and wiring
General power system and electric heating of fixed wiring	A.C. 440 V, 3 ϕ, 3 wires
Lighting circuits up to distribution board	A.C. 100 V, 3 ϕ, 3 wires
Lighting branch circuits	A.C. 100 V, 1 ϕ, 2 wires
Radio and nautical equipments	A.C. 440 V, 3 ϕ, 3 wires, A.C. 100 V, and/or D.C. 24 V, 2 wires
Interior communication equipments	A.C. 100 V, 1 ϕ and/or D.C. 24 V, 2 wires
Automation, instrument and alarm device	A.C. 100 V, 1 ϕ and/or D.C. 24 V, 2 wires

2. Electric Cable

In general, ethylene-propylene (EP) rubber insulated, polyvinyl chloride (P.V.C.) sheathed and basket weave steel wire braided cables (Japanese Industrial Standard(JIS)) approved by the Classification Society to be used throughout the vessel.

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3. Generating Plant

1) Electric generator

Main generators

No.	2 sets
Type	A.C. 450 V, 3 ϕ, 60 Hz, brushless, IP-22
Capacity	500 KVA (400 KW) x 720 RPM

Emergency generator

No.	1 set
Type	A.C. 450 V, 3 ϕ, 60 Hz, brushless, IP-22
Capacity	80 KVA (64 KW) x 1,800 RPM

Operating conditions of generators

At normal sea going	Main generator x 1
At departure and arrival	Main generator x 2
At cargo handling	Main generator x 2
At port	Main generator x 1
At emergency	Emergency generator

2) Switchboards

Dead front self standing type, IP-21 and natural ventilation.

1 - Main switchboard in engine control room

1 - Emergency switchboard in emergency generator room

3) Transformers

Self cooled dry type (A.C. 450V / 105V)

2 - 45 KVA 3ϕ for general service

2 - 15 KVA 3ϕ for emergency service

1 - 7.5 KVA 1ϕ for forward lighting

4) Storage batteries

Lead acid type (D.C. 24 V)

1 - 200 AH for general service

1 - 200 AH for radio equipment

2 - 120 AH for emergency generator

5) Shore connection equipment

1 - A.C. 440 V, 3ϕ, 300 A

4. Motors and Controls

In general, all motors to be of squirrel cage rotor induction type with standard design based on IEC recommendation.

In general, starting method for motors to be of across-the-line start type.

5. Lightings

In general, lighting fixtures and accessories to be designed in accordance with JIS and Manufacturer's Standard.

The vessel to be adequately illuminated by incandescent and/or fluorescent lights.

Lighting system to consist of the following two (2) groups.

1) General lighting system (A.C. 100 V)

Fed from the main generators via general and emergency service transformers.

2) Emergency lighting system (A.C: 100 V)

Fed from the emergency generator via emergency service transformer.

6. Interior Communication Equipments

1 set - Common battery telephone
1 set - Automatic exchange telephone (24 circuits)
1 set - Public addressor with talk back system
1 set - Engine telegraph
4 - Portable UHF transceiver
4 - Shaft revolution indicator
4 - Rudder angle indicator
2 - Signal bell system
1 - General alarm system
1 - Call bell system for engineers
1 - Fire detection and alarm system for accommodation and engine room

7. Nautical Equipments

1 - Magnetic compass
1 - Gyro compass and autopilot with course recorder
1 - Radar with ARPA (X band, 25KW, Raster-Scan CRT, effect. dia. 340 mm)
1 - Radar (X band, 25KW, Raster-Scan CRT, effect. dia. 250 mm)
1 - Echo sounder
1 - Ship speed log (Doppler type)
1 - Loran C navigator
1 - GPS navigator
1 - NAVTEX receiver
1 - Electric clock
1 - Anemometer and anemoscope
3 - Window wiper

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8. Radio Equipments

1 - MF/HF transmitter (400 W)
1 - MF/HF receiver
1 - MF/HF DSC watch keeping receiver
1 - 2182 KHz watch keeping receiver
1 - 406 MHz satellite EPIRB
1 - INMARSAT (STANDARD-C)
1 - Satellite communication system including telex and facsimile (INMARSAT-B)
1 - Radio direction finder
2 - International VHF radio telephone
1 - VHF DSC watch keeping receiver
1 - Weather facsimile recorder (12 inches)
2 - SART (radar transponder)
3 - Two-way VHF radiotelephone apparatus

9. Recreation Equipments

1 - Antenna multi-coupler
1 - Television antenna system

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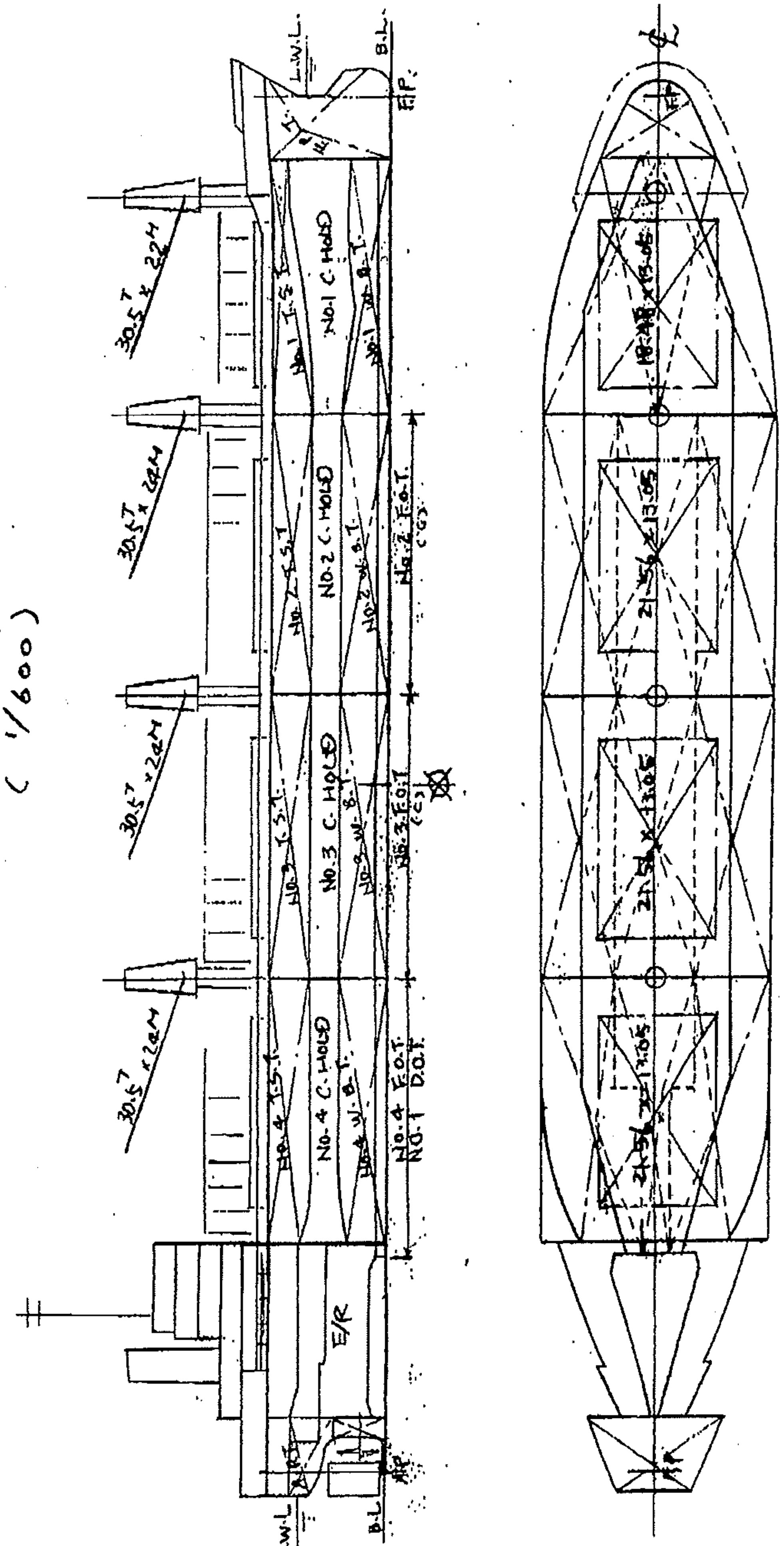
GENERAL ARRANGEMENT
(1/600)



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MIDSHIP SECTION (1/150)