Rpt. 4b

Date of writing report 11th Nov., 1963 — Received London 28 JAN 1964 — Port KOBE — No. FE-1640

Survey held at Sakurajima, Osaka — No. of visits In shops 63, On vessel 18 — First date 21st Dec.,1962, 11th July,1963 — Last date 4th July, 1963, 22nd Nov., 1963

F.E. FROM ADMINTS. 7/2/64
PLANS RECD. 11/2/64
CERTS. REQD. 31/1/64
TO RPTS. DEPT. 31/1/64
14/2/64

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. — Name "ORSHA" — Gross tons

Owners V/D Sudoimport Moscow U.S.S.R. — Managers - — Port of Registry Vladivostock, U.S.S.R.

Hull built at Sakurajima, Japan — By Hitachi Shipbuilding & Eng.Co.,Ltd. — Yard No. 3976 — When Year 1963 Month 11

Main Engines made at do. — By do. — Eng. No. 2181 — When 1963 7

Gearing made at - — By -

Aux. ~~Donkey~~ boilers made at Innoshima, Japan — By Hitachi Shipbuilding & Eng.Co.,Ltd. — Blr. Nos. 712 — When 1963 7

Machinery installed at Sakurajima, Osaka — By Hitachi Shipbuilding & Engineering Co.,Ltd. — When 1963 11

Particulars of restricted service of ship, if limited for classification: None

Particulars of vegetable or similar cargo oil notation, if required: None

Is ship to be classed for navigation in ice? Class 3 — Is ship intended to carry petroleum in bulk? No

Is refrigerating machinery fitted? Yes — If so, is it for cargo purposes? No — Type of refrigerant Freon 12

Is the refrigerating machinery compartment isolated from the propelling machinery space? Yes — Is the refrigerated cargo installation intended to be classed? No

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated

No. of main engines 1 — No. of propellers 1 — Brief description of propulsion system 1 Oil engine direct coupled to line shafting

MAIN ~~RECIPROCATING~~ ENGINES. Licence Name and Type No. Burmeister & Wain's, Hitachi B & W 874VT2BF-160

No. of cylinders per engine 8 — Dia. of cylinders 740 mm — stroke(s) 1600 mm — 2 or 4 stroke cycle 2 — Single or double acting Single

Maximum approved BHP per engine 12000 — at 115 — RPM of engine and 115 — RPM of propeller.

Corresponding MIP 9.5 kg/cm2 (*For DA engines give MIP top & bottom*) — Maximum cylinder pressure 65 kg/cm2 — Machinery numeral 2400

Are the cylinders arranged in Vee or other special formation? No — If so, number of crankshafts per engine -

TWO STROKE ENGINES. Is the engine of opposed piston type? No — If so, how are upper pistons connected to crankshaft? -

Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? Valve in the cyl. cover — No. and type of mechanically driven scavenge pumps or blowers per engine and how driven None

No. of exhaust gas driven scavenge blowers per engine 2 — Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? Yes

If a stand-by or emergency pump or blower is fitted, state how driven None — No. of scavenge air coolers 2 — Scavenge air pressure at full power 0.7 kg/c,2 — Are scavenge manifold explosion relief valves fitted? Yes

FOUR STROKE ENGINES. Is the engine supercharged? - — Are the undersides of the pistons arranged as supercharge pumps? - — No. of exhaust gas driven blowers per engine - — No. of supercharge air coolers per engine - — Supercharge air pressure - — Can engine operate without supercharger? -

TWO ~~STROKE~~ STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 2 — Inlet None — Exhaust 1 — Starting 1 — Safety 1

Material of cylinder covers Cr.Mo.Cast Steel — Material of piston crowns Cr.Mo. Cast Steel — Is the engine equipped to operate on heavy fuel oil? Yes

Cooling medium for :—Cylinders Fresh water — Pistons Lub.Oil — Fuel valves Fuel oil — Overall diameter of piston rod for double acting engines -

Is the rod fitted with a sleeve? No — Is welded construction employed for: Bedplate? Yes — Frames? Yes — Entablature? Yes — Is the crankcase separated from the underside of pistons? Yes — Is the engine of crosshead or trunk piston type? Crosshead — Total internal volume of crankcase 158.0 M3 — No. and total area of explosion relief devices 17 pcs, 9010 cm2 — Are flame guards or traps fitted to relief devices? Yes — Is the crankcase readily accessible? Yes — If not, must the engine be removed for overhaul of bearings, etc? - — Is the engine secured directly to the tank top or to a built-up seating? Built up seating — How is the engine started? By compressed air

Can the engine be directly reversed? Yes — If not, how is reversing obtained? -

Has the engine been tested working in the shop? Yes — How long at full power? 4 hours

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 5-4-63 — State barred speed range(s), if imposed for working propeller None — For spare propeller None — Is a governor fitted? Yes — Is a torsional vibration damper or detuner fitted to the shafting? No

Where positioned? - — Type - — No. of main bearings 10 — Are main bearings of ball or roller type? No — Distance between inner edges of bearings in way of crank(s) 1004.6mm — Distance between centre lines of side cranks or eccentrics of opposed piston engines -

Crankshaft type: Built, semi-built, solid. (*State which*) Built

Diameter of journals 620 mm (115mm bore) — Diameter of crankpins Centre 620 mm, Side - — Breadth of webs at mid-throw 1420 mm — Axial thickness of webs 314 mm

If shrunk, radial thickness around eyeholes 345 mm — Are dowel pins fitted? No — Crankshaft material Pins Forged Steel, Journals Forged Steel, Webs Cast Steel — Minimum 45 kg/mm2, Approved 45 kg/mm2, Tensile strength 45 kg/mm2

Diameter of flywheel 2240 mm — Weight 8092 kg — Are balance weights fitted? Yes — Total weight 15120 kg — Radius of gyration 1.126 M

Diameter of flywheel shaft 570 mm — Material Forged Steel — Minimum approved tensile strength 45 kg/mm2

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (*State which*) Integral with thrustshaft.

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MAIN GAS TURBINES. Name and Type No. .....

No. of sets of turbines ..... Open or closed cycle ..... BHP per set ..... at ..... RPM of output shaft .....

How is drive transmitted to propeller shaft? .....

ARRANGEMENT OF TURBINES. (*A small diagram should be attached showing gas cycle.*) HP drives ..... at ..... RPM HP gas inlet temperature ..... pressure .....

IP drives ..... at ..... RPM IP gas inlet temperature ..... pressure .....

LP drives ..... at ..... RPM LP gas inlet temperature ..... pressure .....

No. of air compressors per set ..... Centrifugal or axial flow type? ..... Material of turbine blades ..... Material of compressor blades ..... No. of air coolers per set ..... No. of heat exchangers per set ..... How are turbines started? .....

How is reversing effected? ..... Are the turbines operated in conjunction with free piston gas generators? .....

Total No. of free piston gas generators ..... Diameter of working pistons ..... Diameter of compressor pistons ..... No. of double strokes per minute at full power ..... Gas delivery pressure ..... Gas delivery temperature ..... Have the turbines and attached equipment been tested working in the shop? ..... How long at full power? .....

ELECTRIC PROPULSION (*Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.*)

No. of generators ..... KW per generator ..... at ..... RPM AC or DC? ..... Position .....

No. of propulsion motors ..... SHP per motor ..... at ..... RPM Position .....

How is power obtained for excitation of generators? ..... Motors? .....

REDUCTION GEARING (*Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.*)

Is gearing of single or double helical type? ..... If single, position of gear thrust bearing ..... Is gearing of epicyclic type? .....

PCD of pinions: First reduction ..... Second reduction ..... PCD of wheels: First reduction ..... Main .....

Material of pinions ..... Tensile strength ..... Material of wheel rims ..... Tensile strength .....

Are gear teeth surface hardened? ..... How are teeth finished? ..... Diameter of pinion journals ..... Wheel shaft journals ..... Are the wheels of welded construction? ..... Is gearcase of welded construction? ..... Has the wheel/gearcase been heat treated on completion of welding? ..... Where is the propeller thrust bearing located? ..... Are gear bearings of ball or roller type? .....

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated .....

Can the main engine be used for purposes other than propulsion when declutched? ..... If so, what? .....

STRAIGHT SHAFTING. Diameter of thrustshaft 570 mm Material Forged Steel Minimum approved tensile strength 45 kg/mm2

Shaft separate or integral with crank or wheel shaft? Integral with wheelshaft Diameter of intermediate shaft 460 (450) Material Forged Steel

Minimum approved tensile strength 45 kg/cm2 Diameter of screwshaft cone at large end 550 / 520 at coupling Is screwshaft fitted with a continuous liner? Yes

Diameter of tube shaft. (*If these are separate shafts*) - Is tube shaft fitted with a continuous liner in way of stern tube - Thickness of screwshaft liner at bearings 29 mm Thickness between bearings 28 mm Material of screw/~~crankshaft~~ shaft Forged Steel Minimum approved tensile strength 45 kg/cm

Is an approved oil gland fitted? No If so, state type - Length of bearing next to and supporting propeller 2250 mm

Material of bearing Lignumvitae In multiple screw vessels is the liner between stern tube and A bracket continuous? - If not, is the exposed length of shafting between liners readily visible in dry dock? - Key way of working & spare shaft in accordance with C1002 of Rules (Root Radius 7mm)

PROPELLER. Diameter of propeller 6,000 mm Pitch 4,970 mm Built up or solid Solid Total developed surface 14.137 M^2

No. of blades 4 Blade thickness at top of root fillet 262 mm Blade material 3% Ni Mr.Br. Moment of inertia of dry propeller 318,150 kg/cm/

If propeller is of special design, state type No Is propeller of reversible pitch type? No If so, is it of approved design? -

State method of control - Material of spare propeller Cast Steel Moment of inertia 314,500 kg/cm2 sec

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine None Can they be declutched? -

No. of independently driven air compressors. (*State capacity, prime mover, position in ship, and Port and No. of certificate*) 2-Main 4.7M^3/H Motor driven starb'd ford & M-8

1-Aux. 0.173 M^3/H Diesel Eng. driven starb'd M-88987, 1-Ship service 0.5 M^3/H motor driven starb'd M-88988.

No. of starting air receivers. (*Main and Aux. State capacity of each, position in ship and Port and No. of Certificate*) 2-Main 11M^3 starb'd in & out under 3rd deck in AR-8

2-Aux. 0.2M^3 P.&S. AR-86707, 1-Ship service 1.5M^3 ford ctr. AR-88676

How are receivers first charged? Aux. air compressor driven by hand start diesel engine Maximum working pressure of starting air system 25 kg/cm2 Are the safety devices in accordance with the Rules? Yes Has the starting of the main engines been tested and found satisfactory? Yes

COOLERS. No. of main engine fresh water coolers 2 No. of main engine lubricating oil coolers 2

No. of Fuel Valve Cooling Oil Coolers 1

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure 1-7.5M^3 D.O. tank starb'd 3rd deck in E.R., 1-D.O.service tank starb'd 3rd deck, 1-2M^3 F.O.sett.tank for boiler in boiler room, 1-1M^3 D.O.tank for port service generator in boiler room, 1-0.25M^3 D.O.tank for emergency fire pump in steering room, 1-1.5M^3 F.O.drain tank for st

MAIN ENGINE DRIVEN PUMPS (*No. and Purpose*) Fuel oil pump for each cylinder (8 sets), Fuel oil supply pump (1 set).

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X																				
	SUCTION									DELIVERY							OVER BOARD	BILGE SEP.	EX.G BOILER	AUX BOILER
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Aux. Boiler	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	M.E. F.O. Valve				
1-Fresh water cooling pump port side motor driven					x							x									
1-Sea water cooling pump port side motor driven 400M^3/H	Emergency	x				x					x										
1-Common reserve cooling pump port side motor driven					x	x					x	x									
1-L.O.pump port (fw'd & aft) motor driven								x							x	x					
2-L.O.pump for turbo-charger starb'd(fw'd & aft) motor driven								x							x						
2-F.O.V.cooling oil pump starb'd(in & out) motor driven				x													x				
1-F.O.transfer pump starb'd side motor driven				x									x								
1-Bilge pump starb'd side motor driven 30/15M^3/Hx35M	x		x			x												x	x		
2-G.S.& fire pump starb'd & port(aft)motor driven			x			x					x			x				x			
2-Bilge ballast pump 150M^3/Hx35M starb'd(fw'd & aft)motor driven	x	x	x			x												x			
2-Boiler water circulating pump starb'd(in & out)B.R.motor driven									x											x	
2-Feed water pump starb'd(in & out)boiler room motor driven							x			x											x
1-F.O.transfer pump starb'd side motor driven				x									x								
1-L.O.service pump, starb'd side motor driven								x							x						
1 FW cooling pump (standby) port side motor driven					x							x									
1 SW cooling pump(standby) port side motor driven						x					x										
1 Emergency fire pump steering room						x								x							
1 Boiler oil burning unit pump boiler room				x																	x

Starboard forward	Yanmar 3S-4	Machinery Co.	KOBE 0-87911 ✓	Aux. Air Compressor
Port 3rd deck (aft)	4 S.C.S.A. 3 PSH-180EF	Daihatsu Kogyo K.K.	KOBE 0-89327 ✓	120KW A.C. Generator
In Steering Room	4 Cycle Single Acting 22 P.S. 3 cyl	do.	KOBE 0-87658 ✓	Emergency fire pump

Is electric current used for essential services at sea? Yes If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea 1 - 400 KVA Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 1 W.P. 7 kg/cm2 Type Flemming multitubular vertical boiler

Position Boiler platform deck (aft)

Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of donkey boilers heated by exhaust gas only? 1 W.P. 7 kg/cm2

Type Coil & header Position In funnel Safety valve set to 11 kg/cm2 Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers? Yes (Steam separator fitted S.V.set to 7 kg/cm2) Port and No. of report on donkey boilers 1-89502 Flemming Boiler M-90280 Economizer Is steam essential for operation of the ship at sea? Yes Are any steam pipes over 3 ins. bore? Yes If so, what is their material? Seamless steel pipe (F.O.heater only) For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure units 1 No. of steam condensers 1 No. of Evaporators 1 (Fresh water generator Atlas type)

STEERING GEAR. (*State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars*)

1- 2 Ram electric hydraulic, 2 motors 2 helwshaw pumps.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements 9-9L. foam extinguishers, 2-45L. foam extinguishers, 7-70mm dia. fire coupling with 20M canvashose, 4-250L. sand boxes, 1-1.1L CC 14 extinguisher, Steam smothering & CO2 extinguisher system

Has the spare gear required by the Rules been supplied? Yes Has all the machinery been tried under full working conditions and found satisfactory? Yes Date and duration of full-power sea trials of main engines 5-11-63 13 hours Does this machinery installation contain any features of a novel or experimental nature? (*Give particulars*) No

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (*strike out words not applicable*).

K. Sasaki

K. Sasaki, Director & Yard Manager *Builder*
Hitachi Shipbuilding & Engineering Co., Ltd.
Sakurajima Shipyard

MAIN GAS TURBINES. Name and Type No.

No. of sets of turbines ..... Open or closed cycle ..... BHP per set ..... at ..... RPM of output shaft .....

How is drive transmitted to propeller shaft? .....

ARRANGEMENT OF TURBINES. (*A small diagram should be attached showing gas cycle.*)
HP drives ..... at ..... RPM HP gas inlet temperature ..... pressure .....
IP drives ..... at ..... RPM IP gas inlet temperature ..... pressure .....
LP drives ..... at ..... RPM LP gas inlet temperature ..... pressure .....

No. of air compressors per set ..... Centrifugal or axial flow type? ..... Material of turbine blades ..... Material of compressor blades ..... No. of air coolers per set ..... No. of heat exchangers per set ..... How are turbines started? .....

How is reversing effected? ..... Are the turbines operated in conjunction with free piston gas generators? .....

Total No. of free piston gas generators ..... Diameter of working pistons ..... Diameter of compressor pistons ..... No. of double strokes per minute at full power ..... Gas delivery pressure ..... Gas delivery temperature ..... Have the turbines and attached equipment been tested working in the shop? ..... How long at full power? .....

ELECTRIC PROPULSION (*Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.*)

No. of generators ..... KW per generator ..... at ..... RPM AC or DC? ..... Position .....

No. of propulsion motors ..... SHP per motor ..... at ..... RPM Position .....

How is power obtained for excitation of generators? ..... Motors? .....

REDUCTION GEARING (*Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.*)

Is gearing of single or double helical type? ..... If single, position of gear thrust bearing ..... Is gearing of epicyclic type? .....

PCD of pinions: First reduction ..... Second reduction ..... PCD of wheels: First reduction ..... Main .....

Material of pinions ..... Tensile strength ..... Material of wheel rims ..... Tensile strength .....

Are gear teeth surface hardened? ..... How are teeth finished? ..... Diameter of pinion journals ..... Wheel shaft journals ..... Are the wheels of welded construction? ..... Is gearcase of welded construction? ..... Has the wheel/gearcase been heat treated on completion of welding? ..... Where is the propeller thrust bearing located? ..... Are gear bearings of ball or roller type? .....

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated .....

Can the main engine be used for purposes other than propulsion when declutched? ..... If so, what? .....

STRAIGHT SHAFTING. Diameter of thrustshaft 570 mm Material Forged Steel Minimum approved tensile strength 45 kg/mm2
Shaft separate or integral with crank or wheel shaft? Integral with wheelshaft Diameter of intermediate shaft 460 (450) Material Forged Steel
Minimum approved tensile strength 45 kg/cm2 Diameter of screwshaft cone at large end 550 ✓ 520 at coupling Is screwshaft fitted with a continuous liner? Yes
Diameter of tube shaft. (*If these are separate shafts*) – Is tube shaft fitted with a continuous liner in way of stern tube – Thickness of screwshaft liner at bearings 29 mm Thickness between bearings 28 mm Material of screwshaft Forged Steel Minimum approved tensile strength 45 kg/c
Is an approved oil gland fitted? No If so, state type – Length of bearing next to and supporting propeller 2250 mm
Material of bearing Lignumvitae In multiple screw vessels is the liner between stern tube and A bracket continuous? – If not, is the exposed length of shafting between liners readily visible in dry dock? – Key way of working & spare shaft in accordance with Cl002 of Rules (Root Radius 7mm)

PROPELLER. Diameter of propeller 6,000 mm Pitch 4,970 mm Built up or solid Solid Total developed surface 14.137 M^2
No. of blades 4 Blade thickness at top of root fillet 262 mm Blade material 3% Ni Mr.Br. Moment of inertia of dry propeller 318,150 kg/cm
If propeller is of special design, state type No Is propeller of reversible pitch type? No If so, is it of approved design? –
State method of control – Material of spare propeller Cast Steel Moment of inertia 314,500 kg/cm2 sec

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine None Can they be declutched? –

No. of independently driven air compressors. (*State capacity, prime mover, position in ship, and Port and No. of certificate*) 2-Main 4.7M^3/H Motor driven starb'd ford & M-
1-Aux. 0.173 M^3/H Diesel Eng. driven starb'd M-88987, ✓ 1-Ship service 0.5 M^3/H motor driven starb'd M-88988. ✓

No. of starting air receivers. (*Main and Aux. State capacity of each, position in ship and Port and No. of Certificate*) 2-Main 11M^3 starb'd in & out under 3rd deck i
2-Aux. 0.2M^3 P.&S. AR-86707, ✓ 1-Ship service 1.5M^3 ford ctr. AR-88676 ✓ AR-8

How are receivers first charged? Aux.air compressor driven by hand start diesel engine Maximum working pressure of starting air system 25 kg/cm2 Are the safety devices in accordance with the Rules? Yes Has the starting of the main engines been tested and found satisfactory? Yes

COOLERS. No. of main engine fresh water coolers 2 No. of main engine lubricating oil coolers 2
No. of Fuel Valve Cooling Oil Coolers 1

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure 1-7.5M^3 D.O. tank starb'd 3rd deck in E.R., 1 D.O.service tank starb'd 3rd deck, 1-2M^3 F.O.sett.tank for boiler in boiler room, 1-1M^3 D.O.tank for port service generator in boiler room, 1-0.25M^3 D.O.tank for emergency fire pump in steering room, 1-1.5M^3 F.O.drain tank for s

MAIN ENGINE DRIVEN PUMPS (*No. and Purpose*) Fuel oil pump for each cylinder (8 sets), Fuel oil supply pump (1 set).

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X																		
	SUCTION									DELIVERY									
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Aux. Boiler	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	M.E. O.B. F.O. Valve	OVER BOARD	BILGE SEP.	EX.G BOILER	AUX BOILER
1-Fresh water cooling pump port side motor driven					x							x									
1-Sea water cooling pump port side motor driven 400M^3/H	Emergency x					x					x										

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room No.1 hold 2-80mm P&S No.2 hold 2-80mm P&S No.3 hold 4-90mm P&S F & A No.4 hold 2-80mm P&S, No.5 hold 4-80mm P&S Fw'd & aft, Duct keel 1-80mm Log recess 1-50mm

No. and size connected to main bilge line in main engine room 2-80mm P&S fw'd, 2-80mm P&S aft, 1-80mm centre aft 2-50mm Coff. bilge in E.R. In tunnel 1-80 mm

In aux. engine room – Size and position of direct bilge suctions in machinery spaces 1-80mm port aft

1-160 starb'd aft Size and position of emergency bilge suctions in machinery spaces 1-260mm port

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Yes Do the piping arrangements comply with the Rules including special requirements for ships ~~fitted with periodically unattended machinery plant, or classed~~ classed for navigation in ice? (*strike out words not applicable*). Yes

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
No.1 starboard	4 cycle single acting B&W 625 M.T.B .H.	Hitachi S.B.& Eng.Co.,Ltd., Innoshima S.Y.	KOBE 0-89843 ✓	400 KVA A.C. Generator
No.2 port inboard	do.	do.	do. ✓	do.
No.3 port outboard	do.	do.	do. ✓	do.
Starboard forward	4 cycle single acting Yanmar SS-4	Showa Pricision Machinery Co.	KOBE 0-87511 ✓	Aux. Air Compressor
Port 3rd deck (aft)	4 S.C.S.A. 3 PSH-180EF	Daihatsu Kogyo K.K.	KOBE 0-89327 ✓	120KW A.C. Generator
In Steering Room	4 Cycle Single Acting 22 P.S. 3 cyl	do.	KOBE 0-87658 ✓	Emergency fire pump

Is electric current used for essential services at sea? Yes If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea 1 - 400 KVA Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 1 W.P. 7 kg/cm2 Type Flemming multitubular vertical boiler
Position Boiler platform deck (aft)
Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of donkey boilers heated by exhaust gas only? 1 W.P. 7 kg/cm2
Type Coil & header Position In funnel Safety valve set to 11 kg/cm2
Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers? Yes (Steam separator fitted S.V.set to 7 kg/cm2) Port and No. of report on donkey boilers 1-89502 Flemming Boiler ✓ M-90280 Economizer ✓
Is steam essential for operation of the ship at sea? Yes Are any steam pipes over 3 ins. bore? Yes If so, what is their material? Seamless steel pipe (F.O.heater only)
For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure units 1 No. of steam condensers 1 No. of Evaporators 1 (Fresh water generator Atlas type)

STEERING GEAR. (*State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars*)
1- 2 Ram electric hydraulic, 2 motors 2 helwshaw pumps.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements 9-9L. foam extinguishers, 2-45L. foam extinguishers, 7-70mm dia. fire coupling with 20M canvashose, 4-250L. sand boxes, 1-1.1L CC 14 extinguisher, Steam smothering & CO2 extinguisher system
Has the spare gear required by the Rules been supplied? Yes Has all the machinery been tried under full working conditions and found satisfactory? Yes Date and duration of full-power sea trials of main engines 5-11-63 13 hours Does this machinery installation contain any features of a novel or experimental nature? (*Give particulars*) No

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (*strike out words not applicable*).

K. Sasaki
K. Sasaki, Director & Yard Manager *Builder*
Hitachi Shipbuilding & Engineering Co., Ltd.
Sakurajima Shipyard

3034/3

GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and give recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

The machinery of this ship has been constructed and installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters.

The material and workmanship are sound and good.

The machinery has been examined under full load working conditions during comprehensive shop and sea trials and found satisfactory.

In my opinion the machinery of this ship is eligible to have the records of +LMC 11,63, TS (CL) 11,63, ABS 11,63 and SPS 11,63.

"Strengthened for navigation in Ice Class 3".

Please Note - The auxiliary boiler feed pumps are stopped and started by means of switch operated by the water level in the boiler. Make up feed supply is also automatic.

The above arrangements tested during sea trials and found satisfactory.

L.O. Christensen

Engineer Surveyor to Lloyd's Register of Shipping.

PARTICULARS OF IDENTIFICATION MARKS ((Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)

RODS Connecting Rod: HC-F 2349, 2344, 2364, 2362, 2342, 2363, 2345, 2348. LLOYD'S KOB

Piston Rod: HC-F 2322-1 & 2, 2319-1 & 2, 2331-1, 2332-1, 2351-2, 2359-1. LLOYD'S KOB

CRANKSHAFT KT-CK 552. LLOYD'S KOB Reamer Bolt: KT-CK 552-1 & 2 LLOYD'S KOB

Piston Crown: HC-C 2524, 2505, 2538, 2520, 2530, 2525, 2531, 2532, 2523. LLOYD'S KOB

THRUSTSHAFT HC-F 2403 LLOYD'S KOB Tie Rod: K-F 3258-1 to 20, 3259-1 to 20 LLOYD'S KOB

GEARING -

INTERMEDIATE SHAFTS HC-F 2512, 2517, 2506 LLOYD'S KOB

SCREW SHAFTS HC-F 2545 LLOYD'S KOB Please Note 1 spare shaft supplied for S.Nos. 3975,6,7,8 & 9.

PROPELLERS No.13029 KOI LR 7-5-63 HT No. R63-10 LLOYD'S SMK Spare Propeller LLOYD'S SMK No.15170 KOI LR 30-7-63 HT No.E63-588

OTHER IMPORTANT ITEMS Crosshead: NAG. 5451-A to D, 5452-A to D LLOYD'S

Cylinder Cover: HC-C 2507, 2498, 2527, 2526, 2476, 2497, 2518, 2475. LLOYD'S KOB

Is the installation a duplicate of a previous case? Yes — If so, state name of vessel m.v. "OREKHOV" (Ship No. 3975)

Date of approval of plans for crankshaft 27-12-1962 — Straight shafting 4-2-62, 18-1-63 27-12-63 — Gearing - — Clutch -

Separate oil fuel tanks 1-4-63 — Pumping arrangements 21-1-63 20-3-63 — Oil fuel arrangements 17-4-63

Cargo oil pumping arrangements - — Air receivers Main 9-5-63 Aux. 28-3-63 Service 30-1-63 — Donkey boilers Fleming 13-3-63 Econo. 14-3-63

Dates of examination of principal parts:—

Fitting of stern tube 19-7-63 — Fitting of propeller 22-7-63 — Completion of sea connections 22-7-63 — Alignment of crankshaft in main bearings 23-9-63

Engine chocks & bolts 13-9-63 23-9-63 — Alignment of gearing - — Alignment of straight shafting 23-9-63 — Testing of pumping arrangements 29-10-63

Oil fuel lines 23-9-63 2-10-63 — Donkey boiler supports 1-8-63 — Steering machinery 5-11-63 — Windlass 5-11-63

Date of Committee FRIDAY 28 FEB 1964

Decision +LMC ES ABS TS(CL) SPS } 11.63

Special Survey Fee

Construction: £ 677.250.-

Installation: 405.000.-

Expenses -

Date when A/c rendered

10m.4.57. T. (MADE & PRINTED IN ENGLAND)