

Rpt. 4b

Date of writing report 24th December 1956

Received London

21 JAN 1957

Port YOKOHAMA

No. 2151A

Survey held at Yokohama

In shops 52  
No. of visits  
On vessel 108-5-1956  
First date 17-9-195627-11-1956 /  
Last date 7-12-56

## FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name M.V. "GEORGIA MARU" Gross tons 7,662.04

Owners Mitsubishi Kaiun K.K. Managers Mitsubishi Kaiun K.K. Port of Registry Tokyo

Hull built at Yokohama, Japan By Yokohama Shipyard & Engine Works, Mitsubishi Nippon Heavy Ind.Ltd. Yard No. 815 Year Month When 1956 -12

Main Engines made at - do - By - do - Eng. No. D 3707 When 1956 - 8

Gearing made at - By -

Donkey boilers made at Osaka, Japan By Hirano Iron Works, Ltd. Blr. Nos. 41312 & 41313 When 1956 - 8

Machinery installed at Yokohama, Japan By Yokohama Shipyard, & Engine Works, Mitsubishi Nippon Heavy Ind.Ltd. When 1956 - 9

Particulars of restricted service of ship, if limited for classification -

Particulars of vegetable or similar cargo oil notation, if required -

Is ship to be classed for navigation in ice? No 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 Dichlorodifluoromethane direct expansion Type -

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 Oil engine 23A 6Cyl. 700m/m x 1200m/m direct coupled

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Yokohama M.A.N. K6Z 70/120 LA type Diesel engine

No. of cylinders per engine 6 Dia. of cylinders 700 m/m stroke(s) 1,200 m/m 2 or 4 stroke cycle 2 Single or double acting Single

Maximum approved BHP per engine 4700 at 128 RPM of engine and 128 RPM of propeller.

Corresponding MIP 7.2 kg/cm<sup>2</sup> (For D.A. engines give MIP top & bottom) Maximum cylinder pressure 60 kg/cm<sup>2</sup> Machinery numeral 940

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? Yes No. and type of mechanically driven scavenge pumps or blowers per

engine and how driven 6 sets of main engine piston under side pumps  
1 set of vertical, tandem double acting piston type, driven by main engine crank shaft

No. of exhaust gas driven scavenge blowers per engine None Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? -

If a stand-by or emergency pump or blower is fitted, state how driven None No. of scavenge air coolers None Scavenge air pressure at full

power 0.254 kg/cm<sup>2</sup> 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 & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 1 Inlet - Exhaust - Starting 1 Safety 1

Material of cylinder covers gray cast iron Material of piston crowns electric furnace cast steel Is the engine equipped to operate on heavy fuel oil? Yes

Cooling medium for:—Cylinders fresh water Pistons fresh water Fuel valves fresh water 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? Yes Total internal volume of crankcase 1664 ft<sup>3</sup> No. and total area of explosion relief

devices 6 x 717 inch<sup>2</sup> Are flame guards or traps fitted to relief devices? No 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? Yes 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? 3 Hrs.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 18-9-56 State barred speed range(s), if imposed

for working propeller 20-35 r.p.m. For spare propeller 20-35 r.p.m. Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? No

Where positioned? - Type - No. of main bearings 7 Are main bearings of ball or roller

type? No Distance between inner edges of bearings in way of crank(s) 894 m/m Distance between centre lines of side cranks or eccentrics of opposed piston engines -

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

Diameter of journals 465 m/m Diameter of crankpins Centre 465 m/m Breadth of webs at mid-throw 870 m/m Axial thickness of webs 285 m/m

If shrunk, radial thickness around eyeholes 197.5 m/m Are dowel pins fitted? No Crankshaft material Journals O.H. Steel Minimum T.S. Web 54.2 kg/mm<sup>2</sup>

Web - do - Approved 53-60 kg/mm<sup>2</sup> Tensile strength 52.6-59.3 kg/mm<sup>2</sup>

Diameter of flywheel 2044 m/m Weight 3070 kg Are balance weights fitted? No Total weight - Radius of gyration 1,650 m/m

Diameter of flywheel shaft 450-335 m/m Material O.H. Steel Minimum approved tensile strength 53 kg/mm<sup>2</sup>

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

009796-009804-0065 1/2

Lloyd's Register  
Foundation



# 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. HP drives ..... at ..... RPM HP gas inlet temperature ..... pressure .....  
 (A small diagram should be attached showing gas cycle.) 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 450 m/m Material O.H. Steel Minimum approved tensile strength 53 kg/mm2  
 Shaft separate or integral with crank or wheel shaft? integral with crank shaft Diameter of intermediate shaft 335 m/m Material O.H. Steel  
 Minimum approved tensile strength 44 kg/mm2 Diameter of screwshaft cone at large end 385 m/m Is screwshaft fitted with a continuous liner? Yes  
 355 m/m adjacent to coupling  
 Diameter of tube shaft. (If these are separate shafts) ..... Is tube shaft fitted with a continuous liner in way of stern tube Electric Furnace  
 bearings 22 m/m Thickness between bearings 17 m/m Material of screw/tube shaft Steel Minimum approved tensile strength 44 kg/mm  
 Is an approved oil gland fitted? No If so, state type ..... Length of bearing next to and supporting propeller 1,600 m/m  
 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? .....

PROPELLER. Diameter of propeller 4,900 m/m Pitch 3,610 m/m Built up or solid Built up Total developed surface 7,769 m2  
 at 0.125 x propeller dia. 150,152 kg-cm  
 No. of blades 4 Blade thickness at top of root fillet 183 m/m Blade material Manganese bronze Moment of inertia of dry propeller 150,152 kg-cm  
 If propeller is of special design, state type ..... Is propeller of reversible pitch type? None If so, is it of approved design? .....  
 State method of control ..... Material of spare propeller Manganese bronze Moment of inertia .....

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine ..... Can they be declutched? .....  
 No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 2 sets. 150 m3/hr x 30 kg/cm2  
 driven by main generator engine, port side inboard and outboard, Yokohama No.M-2729  
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Main, 2 sets, 6m3 each, stbd. fwd. (3rd dk)  
 Yokohama No.YAR-74 & 75, Aux.200 Litre,Port fwd.of floor dk. Yokohama No.YAR-76  
 Charged by hand starting kerosene  
 How are receivers first charged? engine driven air compressor Maximum working pressure of starting air system 30 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 1

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure Settling tank (7m3 x 2), Service (7m3 x 2), for main engine and settling (3m3 x 1), Service (3m3 x 1) for aux. diesel, portside aft (3rd dk), settling (5m3 x 2) boiler, stbd. aft (3rd dk)

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 1 set x Scavenge air pump

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 Cool- ing	Sea	Feed Tanks	Lub. Oil		Boiler Feed	Salt Water Cool- ing	Fresh Water Cool- ing	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cool- ing
Lub.Oil Pump motor driven stbd.	2								X							X	
L.O. Transfer Pump motor driven port									X							X	
F.O. Transfer Pump both stbd. 1-Steam, 1-motor driven					X									X			
F.O. Supply pump, motor driven port					X									X			
F.O. supply & service pump stbd,motor driven					X									X			
G.S.& Fire Pump, motor driven stbd.		X	X	X			X					X			X		
Bilge & ballast pump, stbd. steam driven		X	X	X			X					X			X		
Bilge & Sanitary pump, stbd. motor driven		X					X	X				X			X		
Fresh water pump, stbd. motor driven						X		X			X		X				
Cooling S.W. Pump motor driven stbd.			X				X					X					
Cooling F.W. Pump motor driven stbd.						X					X		X				X
Reserve cooling W.pump, stbd. motor driven						X	X					X	X				X
Boiler feed pump, stbd.(3rd dk) steam driven								X			X						

Capacity:  
95m3/hr  
20m3/hr

## BILGE SUCTIONS. No. and size in each hold, deep tank or pump room

No. 1 No. 2 No. 3 No. 4 No. 5  
 In hold, 2 x 80m/m, 2 x 80m/m, 2 x 70m/m, 2 x 80m/m, 2 x 80m/m, P. & S. Deep Tanks 70m/m x 2

No. and size connected to main bilge line in main engine room 6 x 80m/m In tunnel 1 x 80 m/m

In aux. engine room - Size and position of direct bilge suction in machinery spaces 1 x 160 m/m  
 stbd. side Size and position of emergency bilge suction in machinery spaces 160m/m x 1, port side, fwd.

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 carrying petroleum in bulk, cargo oil or classed for navigation in ice? 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)
Port, inboard & outboard	Yokohama M.A.N.G5V trunk piston type D.E.	Yokohama S.Y. & Engine Works	Yokohama No. M-3083	Generator (170KVA x 2 sets) Air Compressor x 2 sets.

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 set 127.4 k.w. Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 2 W.P. 10 kg/cm2 Type Dry combustion multitubular cylindrical type

Position Port & Starboard, 3rd deck of engine room  
 Is a superheater fitted? No Are these boilers also heated by exhaust gas? Yes No. of donkey boilers heated by exhaust gas only? No W.P. -  
 (one furnace only)  
 Type Position 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 Port and No. of report on donkey boilers Kobe, I-33964 & I-33965 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? O.H. Steel seamless steel pipe 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 None

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

1 set, Janney's electro-hydraulic type, max. torque 22.8 ton-meter, motor 10 H.P.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements Steam smothering, portable froth extinguisher 50L x 2, 11L x 21, Sand box x 2 & Hydrant 2 1/2" x 2

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 4-12-1956 3 Hr Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) None

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).



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 Engine has been constructed under special survey in accordance with the Rules, Approved plans and Secretary's letters.

The quality of workmanship and materials have been found satisfactory.

The Engine was examined under full working condition in the shop and found satisfactory.

The Machinery of this vessel has been satisfactorily installed in the Vessel and tested under working cond

Crank case explosion relief device fitted as per rules.

A notice board fitted at the control station stating that the engine is not to be operated continuously be 30 revolution per minute and the engine tachometer marked accordingly.

It is submitted that the machinery of this vessel is eligible to be classed with this Society with the notation of LMC 12,56, DBS 12,56 and TSCL 12,56.

*[Signature]*  
Engine 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 Piston Rod:- YKA Y-8075-A,B,C,D,F,G. Connecting rod:- YKA Y-8359-A,B,C,D,E,F.

Rie rod:- KOB KF2172-1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16.

CRANKSHAFT OR ROTORSHAFT YKA Y-8066

FLYWHEEL SHAFT KOB FS-F 1184

THRUSTSHAFT integral with crank shaft

GEARING

INTERMEDIATE SHAFTS KOB FS-F 1179, 1180, 1181, 1182, 1183, 1185.

SCREW AND TUBE SHAFTS KOB KF-2188

PROPELLERS YKA YPROP-5-A,B,C,D,E.

OTHER IMPORTANT ITEMS

Is the installation a duplicate of a previous case? Yes If so, state name of vessel M.V. "VIRGINIA MARU" & "YOMA MARU"

Date of approval of plans for crankshaft 9-1-56 Straight shafting 2-7-56 Gearing - Clutch -

Separate oil fuel tanks 4-2-56 Pumping arrangements 18-8-56 Oil fuel arrangements 19-7-56

Cargo oil pumping arrangements - Air receivers 12-1-56 Donkey boilers 7-1-56

Dates of examination of principal parts:-

Fitting of stern tube 17-9-56 Fitting of propeller 18-9-56 Completion of sea connections 20-9-56 Alignment of crank shaft in main bearings 4-10-56

Engine chocks & bolts 24-11-56 Alignment of gearing - Alignment of straight shafting 4-10-56 Testing of pumping arrangements 30-11-

Oil fuel lines 28-11-56 Donkey boiler supports 30-11-56 Steering machinery 4-12-56 Windlass 4-12-56

Date of Committee TUESDAY 12 FEB 1957

Decision + LMC 12,56 (With fuel. inclink.)

TSCL 2 DB 142 eb.

Special Survey Fee Construction ¥468,000-  
Installation ¥234,000-  
Oil Heater & etc ¥100,000-  
Expenses ¥15,000-

Date when A/c rendered