

Rpt. 4b

Date of writing report 31st July, 1960

Received London

Port Nagasaki

No. FE-1069

Survey held at Nagasaki, Japan

In shops 130

Port 1.8.1959

No. 1202117.1960

No. of visits 29

First date 22.3.1960

Last date 16.7.1960

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name m.v. "BROOKLYN MARU" Gross tons 9549.99

Owners Daido Kaiun Kaisha Managers - Port of Registry Kobe

Hull built at Nagasaki, Japan By Mitsubishi Zosen K.K. Yard No. 1532 Year Month 1960-7

Main Engines made at Nagasaki, Japan By Mitsubishi Zosen K.K. Eng. No. 314 (39619) When 1960-5

Gearing made at - By -

Donkey boilers made at Osaka, Japan By Hirano Iron Works Co., Ltd. Blr. Nos. 1646 When 1960-2

Machinery installed at Nagasaki, Japan By Mitsubishi Zosen K.K. When 1960-5

Particulars of restricted service of ship, if limited for classification Ocean Going

Particulars of vegetable or similar cargo oil notation, if required Carrying Vegetable Oil in Deep Tank Aft.

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? Yes Type of refrigerant Dichlorodifluormethane

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

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 Main engine direct coupled propulsion.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Mitsubishi Nagasaki 9 UEC 75/150 Type Engine

No. of cylinders per engine 9 Dia. of cylinders 750mm stroke(s) 1,500mm 2 or 4 stroke cycle 2 Single or double acting Single

Maximum approved BHP per engine 13,000 at 124 RPM of engine and 124 RPM of propeller.

Corresponding MIP 8.79 kg/cm2 (For DA engines give MIP top & bottom) Maximum cylinder pressure 58 kg/cm2 Machinery numeral 2,400 2600

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? Valves No. and type of mechanically driven scavenge pumps or blowers per engine and how driven No

No. of exhaust gas driven scavenge blowers per engine 3 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 Electric Motor Driven No. of scavenge air coolers 3 Scavenge air pressure at full power 0.45 kg/cm2 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 None Exhaust 3 Starting 1 Safety 1

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

Cooling medium for :-Cylinders F.W. Pistons F.W. Fuel valves F.W. Overall diameter of piston rod for double acting engines -

Is the rod fitted with a sleeve? - Is welded construction employed for: Bedplate? Yes Frames? Yes Entablature? No 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 127.98m3 No. and total area of explosion relief devices 9 x 1653.9cm2 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? Tank Top How is the engine started? 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? 2 hours at official shop trial

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 20.5.1960 State barred speed range(s), if imposed for working propeller - For spare propeller - Is a governor fitted? Yes 9.24.10.60 Is a torsional vibration damper or detuner fitted to the shafting? No

Where positioned? - Type - No. of main bearings 12 Are main bearings of ball or roller type? No

Distance between inner edges of bearings in way of crank(s) 1,020mm Distance between centre lines of side cranks or eccentrics of opposed piston engines -

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

Diameter of journals 560mm Diameter of crankpins 260mm dia. centre hole for Nos. 1, 2, 4, 5 & 6 crank pins 890mm Axial thickness of webs 350mm

If shrunk, radial thickness around eyeholes 242.5mm Are dowel pins fitted? No Crankshaft material Journals Forged Steel Minimum 34 Ton/cm2 Tensile strength

Diameter of flywheel 2679.27mm Weight 2300 kg Are balance weights fitted? no Total weight - Radius of gyration -

Diameter of flywheel shaft 560mm Material Forged Steel Minimum approved tensile strength 28 Ton/cm2

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

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 ^{500 mm} ~~at aft coupling~~ ^{reduced to 460 mm} Material Forged Steel Minimum approved tensile strength 28 Ton/□"

Shaft separate or integral with crank or wheel shaft? Diameter of intermediate shaft 460mm. Material Forged Steel

Minimum approved tensile strength 28 Ton/□" Diameter of screwshaft cone at large end 530mm 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 screw/tube shaft liner at bearings 26mm Thickness between bearings 25mm Material of screw/tube shaft Forged Steel Minimum approved tensile strength 28 Ton/□"

Is an approved oil gland fitted? No If so, state type Length of bearing next to and supporting propeller 2,100mm

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 5,700mm Pitch 5,300mm Built up or solid Solid Total developed surface 12.495m²

No. of blades 4 Blade thickness at top of root fillet 240mm Blade material Nickel Al. bronze Moment of inertia of dry propeller 179,838 kg-cm²

If propeller is of special design, state type Is propeller of reversible pitch type? If so, is it of approved design?

State method of control Material of spare propeller 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 of 260m³/min x 30 kg/cm² driven by Diesel generator engine of Daihatsu 5PST-25B (P) Side on main floor. NQAE 436, NQAE 437

1 set emergency air compressor 4.5m³/H x 30 kg/cm² driven by Kerosene engine.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2 main air reservoirs 12m³x30 kg/cm² on (S) side 3rd deck NO. AR-3137-1, 3137-2, 1 aux. air reservoir, 300 lit x 30 kg/cm² on (P) side main floor NO. AR-3141

How are receivers first charged? By 2.5 HP Kerosene Engine 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 3 No. of main engine lubricating oil coolers 1

1 for Jacket, 2 for Piston

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure 1 x 9m³ F.O. service tank on 3rd deck fwd center, 1 x 5m³ F.O. settling tank (A) on 3rd deck, starb. aft, 1 x 5m³ F.O. service tank (A) on 3rd deck fwd center, 2 x 1m² F.O. settling tanks for donkey boiler on starb. fwd. middle plat

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 1 Set of F.O. High Pressure Pump

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	SUCTION										DELIVERY						
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Donkey BOILER	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	Sea
Jacket cooling fresh water pumps (2)					X							X					
(S) inboard & outboard Electric piston casting fresh water pumps (2)					X							X				X	
(S) inboard & outboard Electric cooling sea water pumps (2)	X					X					X						
(S) inboard & outboard Electric h.o. pumps for Main & T.C. (2)								X							X		
(S) inboard & outboard Electric h.o. shifting pump (1)								X							X		
(P) aft. Electric F.O. Service pump (1)																	
(S) Middle Electric F.O. Transfer pump (1)			X														
(S) Middle Electric Bilge pump (1) (P) aft. Electric 30M ³ /h.	X					X											X
Fire & G.S. pump (1) (P) aft. Electric (95/150M ³ /h.)	X	X	X			X					X				X		X
Bilge & Ballast pump (1) (P) aft. Electric (95/150M ³ /h.)	X	X	X			X					X				X		X
Forced circ. pumps (2) for economizer									X	X							
(S) fwd. inboard & outboard Electric Feed water pumps (2) for donkey boiler								X		X							
(S) fwd. inboard & outboard Steam F.O. burning pumps for donkey boiler					X					X							
(S) fwd. Steam Electric										X							

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room In hold (P) 1x80, 1x90, 1x90, 1x50, 1x50 (S) 1x80, 1x90, 1x90, 1x50, 1x50

No. and size connected to main bilge line in main engine room (P) 2x90 (fwd & aft) (S) 2x90

In aux. engine room - Size and position of direct bilge suction in machinery spaces (P) 1x140 (Bilge & Ballast) (S) 2x300 (S.W. Cooling Pumps)

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? No 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? (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)
Port fwd on Eng. platform	Daihatsu 5PST-25B Diesel	Daihatsu Kogyo K.K.	Kob Rpt. FE-7546	1x280 KVA Generator
Port aft. inboard on Eng. platform	"	"	Kob. Rpt. FE-7546	1x280 KVA Generator & Main Air Compressor
Port aft. outboard on Eng. platform	"	"	Kob. Rpt. FE-7546	"
Port on Eng. platform	Kerosene	Kubota Iron & Machy Wks, Ltd.	Kob. Cert. M-62397	Emergency Air Compressor

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 2 Sets, 305 KW 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 Cochran boiler fitted with exh. gas economizer Position Machinery space starboard forward on inner plating of double bottom tank.

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 100 lbs

Type Forced circulation type Position Upper center of dummy funnel 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? as an economizer Port and No. of report on donkey boiler Kob. Rpt. FE-7546

Are any steam pipes over 3 ins. bore? Yes If so, what is their material? 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) 2 sets 22 KW motors & janney rotary pump driven (SL-48) type steering gear with 4 sets oil cylinders and rams.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements Engine room, hydrant 4x70mm & 2x40mm with 3 hose reels & 3 nozzles (2 sprays), froth portable 13x9 lit. (3x9 lit in way of donkey boiler), sand boxes: 2x145 lit in way of donkey boiler, "Kiddle" CO₂ total flooding 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 1.7.1960 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).



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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 vessel has been constructed and installed under Special Survey in accordance with the requirement of Rules, approved plans and Secretary's letters. The material and the workmanship are good.

The main engine was tested under full power working condition in the shop and subsequently during sea trial and found satisfactory.

The explosion relief devices have been fitted to the crank case of main and auxiliary heavy oil engines.

An exhaust gas heated economizer has been fitted to the donkey boiler.

It is submitted that the machinery of this vessel is efficient and eligible to have the class notation **+** LMC in the Register Book with notation of db 100 lbs and the records of machinery surveys: Engine N 7/60, Boiler nd 7/60 and Tail Shaft CL 7/60.

A. Inai Zumi
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 rods: LLOYD'S NAG NO.S-F 3281-1, 2, 3, 4, 5, 6, 7, 8, & 9 (Nagasaki)
Piston rods: LLOYD'S NAG NO. 3097-A, B, C, E, F, G, H, J, & K (Nagasaki)

CRANKSHAFT OR ROTOR SHAFT LLOYD'S NAG NO.S-F 3013F, 3013A, & 3013M (Nagasaki) (EK 3128)

FLYWHEEL SHAFT }
THRUST SHAFT } LLOYD'S NAG NO.Y 14965 (Nagasaki)

GEARING LLOYD'S NAG NO.3174, 5, 6, 7, 8 & 9 (Nagasaki)

INTERMEDIATE SHAFTS LLOYD'S NAG NO.3180 (Nagasaki)

SCREW AND TUBE SHAFTS LLOYD'S NAG NO.MN-BC 3142 (Nagasaki)

PROPELLERS Eccentric Shaft: LLOYD'S NAG NO.S-F3016 (Nagasaki)

OTHER IMPORTANT ITEMS
Crosshead Pins: LLOYD'S NAG NO.S-F 3023-7, 3021-1, 3021-3, 3021-4, 3021-5, 3021-8, 3021-6
3021-7 & 3021-9 (Nagasaki)

Piston Crowns: LLOYD'S NAG NO. 3115-B, C, D, E, F, G, H, J & K. (Nagasaki)

Is the installation a duplicate of a previous case? **No** If so, state name of vessel _____

Date of approval of plans for crankshaft **1-9-1960** Straight shafting **19-4-1960** Gearing _____ Clutch _____

Separate oil fuel tanks **17, 23, 26-3/1960** Pumping arrangements **31-5-1960** Oil fuel arrangements _____

Cargo oil pumping arrangements _____ Air receivers **26-1-1960** Donkey boilers **18-12-1959**

Dates of examination of principal parts:—

Fitting of stern tube **8-4-1960** Fitting of propeller **11-4-1960** Completion of sea connections **12-4-1960** Alignment of crankshaft in main bearings **28-6-1960**

Engine checks & bolts **3-6-1960** Alignment of gearing _____ Alignment of straight shafting **13-6-1960** Testing of pumping arrangements **31-5-1960**

Oil fuel lines **28-6-1960** Donkey boiler supports **5-4-1960** Steering machinery **9-7-1960** Windlass **9-7-1960**

Date of Committee **FRIDAY 11 NOV 1960** Special Survey Fee **£928, 125**

Decision **See Rpt. 1** Expenses **See Rpt. 1 No. FE-1069**

Date when A/c rendered **SEP 20 1960**
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