

Rpt. 4b

Date of writing report 27 August 1960 Received London Port Yokohama  
 Survey held at Yokohama No. of visits In shops 81 30-6-1959  
 On vessel 29 First date 28-12-1959 Last date 28-6-1960

**FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY**

No. in R.B. 44538 Name SUMIDA MARU Gross tons 9431

Owners Nippon Yusen Kaisha Managers Nippon Yusen Kaisha Port of Registry Tokyo

Hull built at Yokohama By Yokohama Shipyard & Engine Wks. Year Month  
 Mitsubishi Nippon Hvy. Ind. Ltd. Yard No. S 836 When 1960 2

Main Engines made at Yokohama By - " - Eng. No. D37823 When 1960 3

Gearing made at - By -

Auxiliary Donkey boilers made at Osaka By Hirano Iron Wks. Ltd. Blr. Nos. B1639 When 1960 2

Machinery installed at Yokohama By Yokohama Shipyard & Engine Wks. When 1960 6  
 Mitsubishi Nippon Hvy. Ind. Ltd.

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

Particulars of vegetable or similar cargo oil notation, if required "AFTER DEEP TANKS - VEGETABLE OIL"

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 Dichlorodifluoromethane

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 One No. of propellers One Brief description of propulsion system Oil Engine 2 SA. 9 Cy. 780 x 1400mm.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Yokohama - M.A.N. K9Z 78/140C

No. of cylinders per engine 9 Dia. of cylinders 780mm stroke(s) 1400mm 2 or 4 stroke cycle 2 Single or double acting S

Maximum approved BHP per engine 12,000 at 112 118 RPM of engine and 112 118 RPM of propeller.

Corresponding MIP 8.68 kg/sq.cm (For DA engines give MIP top & bottom) Maximum cylinder pressure 60 kg/sq cm. 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? Ports No. and type of mechanically driven scavenge pumps or blowers per engine and how driven 9 under piston scavenging pumps

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? -

If a stand-by or emergency pump or blower is fitted, state how driven - No. of scavenge air coolers 5 Scavenge air pressure at full power 0.525 kg/sq.cm 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 One Inlet None Exhaust None Starting One Safety One

Material of cylinder covers Electric Furnace Cast Steel 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? - 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? X-Head Total internal volume of crankcase 171 cub m. No. and total area of explosion relief devices 9; 2.2 sq m.

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? Five hours

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 16/3/60 State barred speed range(s), if imposed for working propeller - For spare propeller - Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? No

Where positioned? - Type - No. of main bearings 11 Are main bearings of ball or roller type? No

Distance between inner edges of bearings in way of crank(s) 1040 mm 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 570mm. Diameter of crankpins Centre 570mm. Breadth of webs at mid-throw 900mm. Axial thickness of webs 320mm.

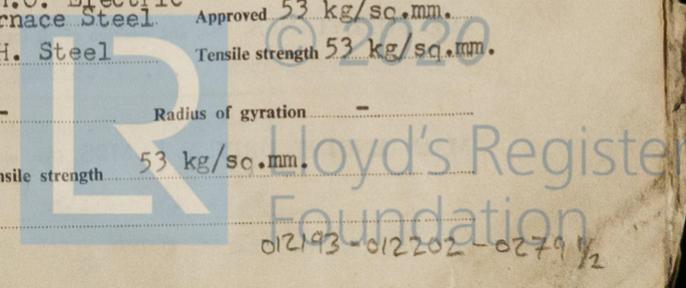
If shrunk, radial thickness around eyeholes 257.5mm. Are dowel pins fitted? No Crankshaft material Journals O.H. Steel Minimum 53 kg/sq.mm.

Webbs O.H. Steel Tensile strength 53 kg/sq.mm.

Diameter of flywheel 2300mm. Weight 2600 kg Are balance weights fitted? No Total weight - Radius of gyration -

Diameter of flywheel shaft 570-458 mm. Material O.H. Steel Minimum approved tensile strength 53 kg/sq.mm.

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



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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.** 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 530 mm. Material O.H. Steel Minimum approved tensile strength 53 kg/sq.mm.

Shaft separate or integral with crank or wheel shaft? Integral Diameter of intermediate shaft 458 mm. Material O.H. & Electric Furnace

Minimum approved tensile strength 44 kg/sq.mm. Diameter of screwshaft cone at large end 527 mm. 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 26 mm. Thickness between bearings 20 mm. Material of screw/tube shaft O.H. Steel Minimum approved tensile strength 44 kg

Is an approved oil gland fitted? \_\_\_\_\_ If so, state type \_\_\_\_\_ Length of bearing next to and supporting propeller 2,100mm.

Material of bearing lignum vitae \_\_\_\_\_ 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 5900mm. Pitch 5200mm. Built up or solid Solid Total developed surface 12 sq.m.

No. of blades 4 Blade thickness at top of root fillet 252.5mm. Blade material manganese bronze Moment of inertia of dry propeller 2700 x 10<sup>5</sup> kg

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

State method of control \_\_\_\_\_ Material of spare propeller Cast Iron Moment of inertia 3560 x 10<sup>5</sup> kg/s

**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-each 265 cub.in./hour; Aux: Engines

ps frd inner and outer, Yka Rpt 10 No.M6067; 1-75 litre/minute, Petrol Engine, ps outb'd, Kob Rpt 10 No.M61750

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Main-2, each 12,000 litre (Eng Room p & s)

Yka Cert AR No.146/7; Aux - 1-300 litre (Eng.Rm.p) Yka Cert AR No.148; Cold Start Air Receiver 150 litre (Eng Yka Cert AR No.149

How are receivers first charged? Compressor via hand start petrol engine working pressure of starting air system 30 kg/sq cm 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 5-Eng. Rm aft. port to starboard on 2nd & 3rd Decks (M.E. Settling and Service; Aux. Settling and Service; Boiler Settling resp.).

**MAIN ENGINE DRIVEN PUMPS** (No. and Purpose) \_\_\_\_\_ None

Service for which each pump is connected to be marked thus X

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	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling
Bilge/Ballast (E.R.ss aft) Motor 150 cub m./hr.	X	X	X			X							X		
Bilge/Ballast (E.R.ss aft, inboard) Motor 150 cub m./hr.	X	X	X			X							X		
Bilge/Ballast (E.R.ss inboard) Motor 30 cub m./hr.	X		X			X				Aux: X					
2-Aux: Blr Feed (Steam) E.R. ss frd inner and outer							X		X				M.E. X		
2-M.E.Lub. oil Supply (Motor) E.R. ss inner and outer										M.E. X			Superch. X		
2-Supercharger L.O. Supply (Motor) E.R. ss.										Superch: X			Superch. X		
Lub. oil Trans. (Motor) E.R. ps.															
O.F. Service & Supply (Motor) E.R. ps. outer					X							X			
O.F. Supply (Motor) E.R. ps inner					X							M.E. X			
2-O.F.Trans. (Motor) E.R. ps. frd & aft					X							X			
M.E. F.W. Circulating (Motor) E.R. ss.frd.						X					X				X
S.W.Cooling (Motor) 500 cub m./hr. E.R. ss. aft.		X					X			X					
Stand-By F.W/S.W. Cooling (Motor) 500 cub m./hr. E.R. ss centre		X			X	X				X	X				

**BILGE SUCTIONS.** No. and size in each hold, deep tank or pump room. Holds:- No.1-2x80mm. No.2-2x90mm. No.3-2x90mm. No.4 frd-2x80mm. lower 'tween dk. 2x70mm. Deep Tks. No.4 aft-2x80mm. lower 'tween dk. 2x70mm. Deep Tks. No.5-4x90mm. No.6-2x80mm, 2x100mm. in Semi Deeps.

No. and size connected to main bilge line in main engine room 5 x 80mm. 5 x 50mm. in Cofferdams In tunnel 1 - 80mm. dia.

In aux. engine room \_\_\_\_\_ Size and position of direct bilge suction in machinery spaces 1-160mm. dia. ✓

ss aft; 1-80mm. dia. ps frd. ✓ Size and position of emergency bilge suction in machinery spaces 1-260mm dia. ps frd. ✓

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 for 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)
Engine Room ps forward, Yokohama-M.A.N. inboard 2SCSA(Supercharged)		Tokyo Motor Vehicle Wks. and Mitsubishi Nippon Hvy. Ind. Ltd.	Yka. Rpt. 4c No. 3311-B	Electric Generator (300 KVA) Air Compressor
Engine Room ps forward, outboard	" "	" "		Electric Generator (300 KVA) Air Compressor
Engine Room ps aft.	" "	" "		Electric Generator (300 KVA)

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 2-270 Kw. Is an electric generator driven by Main Engine? No

**STEAM INSTALLATION.** No. of donkey boilers burning oil fuel One w.p. 100 lb/sq in Type Vertical (Cochran)

Position Engine Room, lower platform, ss forward. ✓

Is a superheater fitted? No Are these boilers also heated by exhaust gas? No Economisers No. of donkey boilers heated by exhaust gas only? One w.p. 10 kg/sq cm.

Type forced circulation Position Lower part of 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? in conjunction with oil fired boiler Port and No. of report on donkey

Economiser:- Yka Rpt 10 No.M-6219 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 For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure

units 2 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) Electro-Hydraulic, 2 motors-Fuji Denki

No's 7889Y/90Y; 2 pumps with 4 rams Kob Rpt 10 No. M-8554

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements 62 bottles Co2, each 45 kg of Gas, ER & Holds 14-9 litre portable foam extinguishers; 3 lengths canvas hose with jet/spray nozzles; 2 sand boxes with scoops; O.F.suction valves fitted controls to deck; O.F.unit, O.F.transfer pump and vent fans capable of being stopped from outside mchy.space; E.R.skylight capable of being closed from outside mchy space.

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 17-6-1960 2 Hrs 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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 H. Suzuki  
 Yokohama Shipyard & Engine Works Builder  
 Lloyd's Register Foundation  
 0279 2/2

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 has been constructed and efficiently installed in this vessel in accordance with the Rules, approved plans and Secretary's letters, tried under full power working conditions and found satisfactory. The materials and workmanship are satisfactory.

The machinery is eligible, in my opinion, to be Classed in the Register book with the notation **+** LMC 6/60 and to have records Oil Engine 2 SA. 9 Cy 780 x 1400mm. TS(CL) 6/60 1 Aux. B 100 lb/sq inch.

*J. Winn.*

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.)

TIE:- Lloyd's Kob No.K-2769-2 to -22 inclusive. E.I.11-9-59 Finish m/c J.W. 11-9-59 Yka.  
 CONNECTING:- Lloyd's Yka No.Y13171A,B,C,D,E,F,G. 20-6-59 S.T. Y13173A,D. 3-7-59 K.I.  
 PISTON:- Lloyd's Yka No.Y13147-B. 5-5-59 S.T.; Y13152 14-5-59 S.T.; Y13155B,C,E,F,G,H,J. 30-5-59 S.T.

CRANKSHAFT OR ROTOR SHAFT- Lloyd's Kob No.KT-CK410 E.I. 31-10-59

FLYWHEEL SHAFT Lloyd's Yka No.Y14763 K.I. 19-12-59 I.S. 12-19-59

THRUST SHAFT

GEARING-

INTERMEDIATE SHAFTS Lloyd's Yka No.14758 A,/B,/C,/D,/E. 14759 14760 K.I. 14-12-59

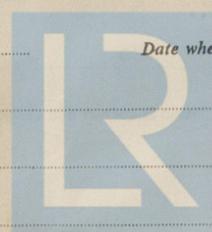
SCREW AND TUBE SHAFTS Lloyd's Kob No.KT-FL420 M.K. 7-1-60 Finish m/c J.W. 8-2-60 Yka.

PROPELLERS Lloyd's Nag No.MN-BC 3135 A.I. 14-1-60

OTHER IMPORTANT ITEMS Cast Iron Stern Tube LLOYD'S TEST 4 Kg/sq cm J.W. 2-2-1960 Yka.

Cylinder Covers Lloyd's Yka. M34YC 199 J.W.1-2-60; /887 J.W.1-2-60; /936 J.W.2-2-60; /1433 J.W.2-2-60; /1475 J.W.3-2-60; /1476 J.W.3-2-60; /1520 I.S.4-2-60; /1552 I.S.4-2-60; /1553 J.W.5-2-60.

Is the installation a duplicate of a previous case?	Yes	If so, state name of vessel	SAITAMA MARU	
Date of approval of plans for crankshaft	23-3-1960	Straight shafting	14-9-1959	Gearing Clutch
Separate oil fuel tanks	3-12-1959; 8-2-1960	Pumping arrangements	11-11-1959; 19-1-1960	Oil fuel arrangements
Cargo oil pumping arrangements	-	Air receivers	22-1-1960	Donkey boilers
Dates of examination of principal parts:-				
Fitting of stern tube	6-2-1960	Fitting of propeller	8-2-1960	Completion of sea connections
Engine checks & bolts	2-4-1960	Alignment of gearing	-	Alignment of straight shafting
Oil fuel lines	10-6-1960	Donkey boiler supports	4-3-1960	Steering machinery
Date of Committee	FRIDAY 14 OCT 1960		Special Survey Fee	Construction
Decision	See Rpt. 1.			Installation
Expenses				



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