Rpt. 4b.

REPORT ON OIL ENGINE MACHINERY.

No. 450

Received at London Office 13 SEP 1955

Date of writing Report 14th June 1955 When handed in at Local Office ..... 19 ..... Port of Shimonoseki

No. in Reg. Book. Survey held at Nagasaki, Japan Date, First Survey 4th February, 1954 Last Survey 11th June 1955 Number of Visits 119

Single / on the ~~Twin~~ / ~~Triple~~ / ~~Quadruple~~ Screw vessel M.V. "KOCHU MARU" carrying vegetable oil in deep tanks in way of tunnel. Tons Gross 9197.25 Net 5372.24

Built at Nagasaki, Japan By whom built Mitsubishi Zosen K.K. Yard No. 1445 When built 6mo/1955

Engines made at Nagasaki, Japan By whom made Mitsubishi Zosen K.K. Engine No. 276 When made 3mo/1955

Donkey Boilers made at Nagasaki, Japan By whom made Mitsubishi Zosen K.K. W.T. Vertical Boiler No. 1396 / 1399 When made 2mo/1955 / 3mo/1955

Brake Horse Power { Maximum 8500 / Service 7225 } Owners Daido Kaiun K.K. Port belonging to Kobe

M.N. as per Rule 1700 / Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

Trade for which vessel is intended International, Ocean going

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OIL ENGINES, &c. —Type of Engines Mitsubishi 6UEC 75/150 2 or 4 stroke cycle 2 Single or double acting Single

Maximum pressure in cylinders 58 kg/cm² Diameter of cylinders 750 mm Length of stroke 1500 mm No. of cylinders 6 No. of cranks 6

Mean Indicated Pressure 8.76 kg/cm² Span of bearings (i.e., distance between inner edges of bearings in way of a crank) 1020 mm Is there a bearing between each crank Yes Revolutions per minute { Maximum 122 / Service 115.6 }

Flywheel dia. 2595 mm Weight 9500 kgs. Moment of inertia of flywheel (~~lbs. in² or~~ Kg.cm.²) 409X10⁸ Means of ignition Compression Kind of fuel used Heavy oil

" " " " balance wts. (" " " " " ") —

Crank Shaft, { ~~Solid forged~~ / Semi built / ~~All built~~ } dia. of journals as per Rule As approved as fitted 560 mm Crank pin dia. 560 mm Crank webs Mid. length breadth 890 mm. Mid. length thickness 350 mm. { shrunk / Thickness parallel to axis 350 mm. Thickness around eyehole 2425 mm

Combined Thrust & Flywheel Shaft, diameter as per Rule As approved as fitted 560 mm Intermediate Shafts, diameter as per Rule As approved as fitted 410 mm Thrust Shaft, diameter at collars as per Rule — as fitted —

Tube Shaft, diameter as per Rule — as fitted — Screw Shaft, diameter as per Rule As approved as fitted 470 mm reduced to 430 mm adjacent to coupling Is the { tube / screw } shaft fitted with a continuous liner { — / Yes }

Bronze Liners, thickness in way of bushes as per Rule As approved as fitted 26 mm Thickness between bushes as per Rule As approved as fitted 20 mm Is the after end of the liner made watertight in the propeller boss Yes If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner —

If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive — If two liners are fitted, is the shaft lapped or protected between the liners — Is an approved **Oil Gland** fitted at the after end of stern tube No If so, state type — Length of bearing in **Stern Bush** next to and supporting propeller 1,880 mm.

Propeller, dia. 5200 mm Pitch 4700 mm No. of blades 4 Material Mn. Bronze whether moveable Moveable Total developed surface 8.906 sq. ~~feet~~ M

Moment of inertia of propeller including entrained water (~~lbs. in² or~~ Kg.cm.sec² $\left(\frac{GD^2}{g}\right)$) 174,525. Kind of damper, if fitted not fitted

Method of reversing Engines Self. Is a governor or other arrangement fitted to prevent racing of the engine Yes Means of lubrication Forced Thickness of cylinder liners 45 mm Are the cylinders fitted with safety valves Yes Are the exhaust pipes and silencers water cooled or lagged with non-conducting material Lagged If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine —

Cooling Water Pumps, No. and how driven Electric motors Working F.W. Jacket 1 / Piston 1 F.W. 1 Spare F.W. Jacket 1 / Piston 1 S.W. 1 Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes

Bilge Pumps worked from the **Main Engines,** No. and capacity — Can one be overhauled while the other is at work —

Pumps connected to the **Main Bilge Line** { No. and capacity of each 1 X 100/200 Bilge Ballast Pump, 1 X 95/150 Fire G.S. Pump, 1 X 30 Bilge Pump, m³/hr. / How driven Electric motor, Electric motor, Electric motor. }

Is the cooling water led to the bilges No If so, state what special arrangements are made to deal with this water in addition to the ordinary bilge pumping arrangements —

Ballast Pumps, No. and capacity { 1 X 100/200 & 1 X 95/150 m³/hr / O.F. 1 X 50 m³/hr } **Power Driven Lubricating Oil Pumps,** including spare pump, No. and size 2 X 50 m³/hr

Are two independent means arranged for circulating water through the **Oil Cooler** Yes **Branch Bilge Suctions**

No. and size:—In machinery spaces P. S. Fwd. 1 X 90, Aft 1 X 90. 1 X 50, Tunnel 1 X 90. in mm. In pump room —

In holds, &c. { P. 1 X 80 / S. 1 X 80 No. 1 hold, 1 X 80 / 1 X 80 No. 2 hold, 1 X 80 / 1 X 80 No. 3 hold, 1 X 50 / 1 X 50 Coff. 93/94, 1 X 50 / 1 X 50 Coff. 87/88, 1 X 50 Coff. L.O. (Bilge tank), 1 X 70 / 1 X 70 No. 4 hold fwd., 1 X 80 / 1 X 80 Deep T.K.s, 1 X 70 / 1 X 70 No. 4 hold aft., 1 X 80. 1 X 80 / 1 X 80. 1 X 80 No. 5 hold fwd & aft., 1 X 80 / 1 X 80 No. 6 hold, in mm.

Direct Bilge Suctions to the engine room bilges, No. and size { P. aft 1 X 140 Bilge Ballast Pump, S. aft 1 X 90 Fire G.S. Pump, S. fwd. 1 X 240 Cooling S.W. Pumps, in mm.

Are all the bilge suction pipes in holds ~~and tunnel well~~ fitted with strum-boxes Yes Are the bilge suctions in the machinery spaces led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges Yes

Are all **Sea Connections** fitted direct on the skin of the Ship Yes Are they fitted with valves or cocks Yes Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plates Yes Are the overboard discharges above or below the deep water line Below

Are they each fitted with a discharge valve always accessible on the plating of the vessel Yes Are the blow off cocks fitted with a spigot and brass covering plate Yes

What pipes pass through the bunkers — How are they protected —

What pipes pass through the deep tanks Steam heating pipes Have they been tested as per Rule Yes

Are all pipes, cocks, valves and pumps in connection with the machinery and all boiler mountings accessible at all times Yes

Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another Yes Is the shaft tunnel watertight Yes Is it fitted with a watertight door Yes worked from Upper deck

If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork —

Main Air Compressors, No. — No. of stages — diameters — stroke — driven by —

Auxiliary Air Compressors, No. 2 No. of stages 3 diameters H.P. 95 / I.P. 310-260 / L.P. 310-95 mm stroke 200 mm driven by Generator engines

Small Auxiliary Air Compressors, No. 1 No. of stages 2 diameters H.P. 28 L.P. 60 mm stroke 55 mm driven by 2 H.P. Kerosene engine

What provision is made for first charging the air receivers By starting above small auxiliary air compressor engine

~~Scavenging~~ Supercharging **Air Pumps or Blowers,** No. 2 Turbo blowers How driven Exhaust gas turbines

Auxiliary Engines Have they been made under survey Yes Engine Nos. 291, 289, 290

Makers name Nagasaki Works, Mitsubishi Zosen K.K. Position of each in engine room P. fwd., P. aft and fwd., P. aft and S. aft.

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AIR RECEIVERS:—Have they been made under survey Yes State No. of report or certificate Nag. M-11260

State full details of safety devices 1-50mm dia. single spring safety valve fitted to each receiver

Can the internal surfaces of the receivers be examined and cleaned Yes Is a drain fitted at the lowest part of each receiver Yes

Injection Air Receivers, No. — Cubic capacity of each — Internal diameter — thickness —

Seamless, welded or riveted longitudinal joint — Material — Range of tensile strength — Working pressure —

Starting Air Receivers, No. 2 Total cubic capacity 20 m³ Internal diameter 1800 mm thickness 32 mm

Seamless, welded or riveted longitudinal joint Welded Material Boiler steel Range of tensile strength 54.7~54.8 / 54.3~54.6 kg/mm² Working pressure 30 kg/cm²

IS A DONKEY BOILER FITTED Yes If so, is a report now forwarded Yes

Is the donkey boiler intended to be used for domestic purposes only Yes

PLANS. Are approved plans forwarded herewith for shafting 17.2.55 Receivers 26.10.54 Separate fuel tanks 2.12 / 31.12

W.T. 22.6.54, 8.11.54, 19.3.55. (If not, state date of approval)

Donkey boilers Vertical 25.11.54, 28.1.55, 28.12.54 General pumping arrangements 8.11.54, 18.12.54 Pumping arrangements in machinery space 2.12.54, 22.1.55.

Oil fuel burning arrangements 22.1.55.

Have Torsional Vibration characteristics been approved Yes Date and particulars of approval 16.3.55,

SPARE GEAR. for a service speed of 120 r.p.m. with barred speed range below 34 r.p.m. Max. service speed revised to 122 r.p.m. and noted 14.4.55 (Kobe letter)

Has the spare gear required by the Rules been supplied Yes State if for "short voyages" only 115.6 service 122 max not below 34 R.P.M.

State the principal additional spare gear supplied One piston crown complete with rod, One cylinder cover, One cylinder liner.

The particulars of the installation as fitted are as approved for Torsional Vibration Characteristics.

The foregoing is a correct description, I. Maebashi

Manufacturer NAGASAKI WORKS MITSUBISHI SHIPBUILDING & ENGINEERING CO., LTD.

Dates of Survey while building

During progress of work in shops — 1954. Feb. 4.9.13.18, March 2.3.4.5.18, April 6.16, May 17.27, June 17.19.25.30, July 2.3.9.10.12.13.15.26.27.28, Aug. 5 Sept. 3.13.15.17.21.28.29, Oct. 11.15.16.19.21.22.23.29.30, Nov. 2.6.9.17.30, Dec. 7.10.18.21.22.28, 1955 Jan. 8.13.19.20.24.25.26.27.28.29.31, Feb. 1.3.7.14.15.17.21.25.26.28, March 1.2.3.4.5.8.9.10.17.18.22.24.25.26.30.31, April 5.8.9.11.12,

During erection on board vessel — 1955 April 14.18.19.22.27.28, May 5.12.14.17.19.26.27.30, June 1.3.4.6.8.9.11,

Total No. of visits 119

Dates of examination of principal parts—Cylinders 8.4.55 Covers 9.4.55 Pistons 28.4.55 Rods 11.4.55 Connecting rods 11.4.55

Crank shaft 11.4.55 Flywheel shaft and Thrust shaft 11.4.55 Intermediate shafts 28.2.55 Tube shaft —

Screw shaft 3.3.55 Propeller 14.2.55 Stern tube 1.3.55 Engine seatings 5.5.55 Engine holding down bolts 5.5.55

Completion of fitting sea connections 9.3.55 Completion of pumping arrangements 1.6.55 Engines tried under working conditions 18.3.55 & 3.6.55 & 6.6.55

Crank shaft, material Carbon steel forging Identification mark 121 E&A AM Flywheel shaft, material, and Identification mark —

Thrust shaft, material Carbon steel forging Identification mark M10643 AM Intermediate shafts, material Carbon steel forg. Identification marks 301, 302, 305, 306, 303, 307, 304

Tube shaft, material — Identification mark — Screw shaft, material Carbon steel forging Identification mark 308 AM

Identification marks on air receivers No. 370 LLOYD'S TEST NAG 48.5 KG WP 30 KG AM R 21.2.55.

No. 371 LLOYD'S TEST NAG 48.5 KG WP 30 KG AM R 21.2.55

Welded receivers, state Makers' Name Nagasaki works, Mitsubishi Zosen K.K., Nagasaki, Japan

Is the flash point of the oil to be used over 150°F Yes

Have the requirements of the Rules for oil fuel pipes and tank fittings been complied with Yes

Full description of fire extinguishing apparatus fitted in machinery spaces: Hydrant. 4 at 70mm & 2 at 40mm with 3 hose reels & 3 nozzles (2 spray). Froth portable 12 at 9 (2 in way D.B.) Sand box 1 at 0.28 M³ in way D.B., KIDDE CO₂ system 101 cylinders at 55 L. operated at control station. 2 cyl. at 55 L. supply CO₂ to 2 hose reels with pull boxes in mchy. sp

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo Yes If so, have the requirements of the Rules been complied with Yes

What is the special notation desired —

If the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with —

Is this machinery duplicate of a previous case No If so, state name of vessel —

General Remarks (State quality of workmanship, opinions as to class, Speed restrictions, &c.) The Machinery Installations of this ship have been made under special survey in accordance with the requirements of the Rules, the approved plans and the Secretary's letters. The materials and workmanship are good. The main engine was tested under full power work conditions in the shop and subsequently during sea trials and found satisfactory. The torsional vibration characteristics of main propelling machinery, approved on the 16th March, 1955, were verified by torsiograph reco taken during sea trials, the minimum "tick over" speed was recorded 40 r.p.m. and confirmed above the barred speed ra The explosion relief devices have been fitted to the crank cases of main and auxiliary heavy oil engines. It is submitted that the Machinery of this ship is eligible to have the class notation of ✠ LMC 6.55, with the notations of DB 100 tt, DB (WT) 100 tt and Ref. Mchy. (See separate sectio in the Register Book.

The amount of Entry Fee £855,000

Special ... ... £

Donkey Boiler Fee... ... £

Travelling Expenses (if any) £ See Rpt. 1

When applied for 5 AUG 1955 LOCALLY 19

When received 19

F. P. Manson + Self

A. Murao

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRIDAY 21 OCT 1955

Assigned +LMC 6.55 DB 100 tt. WTDB (Exc. gas) 100 tt. CL.

(The Surveyors are requested not to write on or below the space for Committee's Minute.)

Certificate (if required) to be sent to

+ NK 20/9/55

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