

Rpt. 4a.

Report on Steam Turbine Machinery.

Kob. No. 1536

No. FE 33

Received at London Office

59 SEP 1953

27 AUG 1953

Port of Yokohama & Kobe

Date of writing Report 19

When handed in at Local Office

No. in Survey held at Tokyo & Aioi Japan

Date First Survey 12th Aug. 1952

Last Survey 26-6 1953

Reg. Book

(Number of Visits 133)

on the Steel Single Screw S.T. "KOHO-MARU"

Tons (Gross 17828.22 Net 13377.88)

Built at Aioi Japan

By whom built Harima Shipbuilding & Engineering Co. Ltd.

Yard No. 477

When built July 1953

Engines made at Tokyo Japan

By whom made Ishikawajima Heavy Industries Co. Ltd.

Engine No. 1T.2192

When made July 1953

Boilers made at Aioi Japan

By whom made Harima Shipbuilding & Engineering Co. Ltd.

Boiler No. B.762

When made July 1953

Shaft Horse Power at Full Power 14,000

Owners Iino Kaikan K.K.

Port belonging to Tokyo

Nom. Horse Power as per Rule 2,800

Is Refrigerating Machinery fitted for cargo purposes No

Is Electric Light fitted Yes

Trade for which Vessel is intended Ocean going (carrying oil in bulk)

STEAM TURBINE ENGINES, &c.—Description of Engines Impulse Multistage Turbine

No. of Turbines Ahead 2 Direct coupled, single reduction geared to main propelling shafts No. of primary pinions to each set of reduction gearing 2

direct coupled to Alternating Current Generator phase periods per second rated Kilowatts Volts at revolutions per minute; Direct Current Generator

for supplying power for driving Propelling Motors, Type rated Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE BLADING.

H. P.

I. P.

L. P.

ASTERN.

Impulse Blading { No. of rows 11 No. of stages Reaction Blading { No. of rows in each stage

Shaft Horse Power at each turbine H.P. 6,720 I.P. 7,280 L.P. 7,280 Revolutions per minute, at full power, of each Turbine Shaft H.P. 4,683 I.P. 3,174 L.P. 3,174 1st reduction wheel 565 1st main shaft 170

Rotor Shaft diameter at journals H.P. 160 I.P. 230 L.P. 230 Pitch Circle Diameter 1st pinion 220.86 1st reduction wheel 175.69 2nd pinion 653.86 main wheel 3371.72 Width of Face 1st reduction wheel 450x2 main wheel 650x2

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion 320 1st reduction wheel 990 2nd pinion 990 main wheel 207.26 1st LP 285.72 2nd LP 662.10

Flexible Pinion Shafts, diameter at bearings 1st HP 195 2nd LP 250 Pinion Shafts, diameter at bearings External 1st HP 160 2nd LP 360 Internal 1st LP 180 2nd LP 360 diameter at bottom of pinion teeth 272 central hole HP 634.46 2nd LP 662.10

Wheel Shafts, diameter at bearings 1st HP LP 300 main 580 diameter at wheel shroud, 1st LP 1839.14 2nd LP 1760.69 Generator Shaft, diameter at bearings main 3387.72 Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule 520 mm Thrust Shaft, diameter at collars as per rule 280 mm

Tube Shaft, diameter as per rule as fitted Screw Shaft, diameter as per rule 570 mm Is the tube screw shaft fitted with a continuous liner Yes

Bronze Liners, thickness in way of bushes as per rule 27 mm Thickness between bushes as fitted 21 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 or other appliance fitted at the after end of the tube shaft If so, state type Length of Bearing in Stern Bush next to and supporting propeller 2,350 mm

Propeller, diameter 6,700 mm Pitch 4,500.8 No. of Blades 4 State whether Moveable Movable Total Developed Surface 171.15 square feet.

If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Yes Can the H.P. or L.P. Turbines exhaust direct to the

Condenser Yes No. of Turbines fitted with astern wheels 1 Feed Pumps No. and size 3-350 gallon/min x 51.8 196m² How driven Steam TurbinePumps connected to the Main Bilge Line No. and size 1-100 M³/H 1-100 M³/H 1-60 M³/H How driven motor steam motorBallast Pumps, No. and size 1-100 M³/H x 3.0 M Lubricating Oil Pumps, including Spare Pump, No. and size 2-180 M³/H x 35 M

Are two independent means arranged for circulating water through the Oil Cooler Yes Suctions, connected both to Main Bilge Pumps and Auxiliary

Bilge Pumps, No. and size:—In Engine and Boiler Room 1-6", 1-5", 4-4" in Eng. 4-2" in Eng. Coff. In Pump Room 2-3" & 1-4"

In Holds, &c. 1-2" Fore pump room 2-3" Fore cargo hold.

Main Water Circulating Pump Direct Bilge Suctions, No. and size 1-4.50" Independent Power Pump Direct Suctions to the Engine Room

Bilges, No. and size 1-6" 1-4" Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes

Are the Bilge Suctions in the Machinery Space 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 BOTH

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold 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 Ballast & Bilge Suc. pipe How are they protected

What pipes pass through the deep tanks Have they been tested as per rule

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 No Is it fitted with a watertight door worked from

BOILERS, &c.—(Letter for record) Total Heating Surface of Boilers Evaporating Tube 1030 M² Water Tube 152.8 M² Superheater 282.8 M² 281.0 M² Total 1926.2 M² Is Forced Draft fitted Yes No. and Description of Boilers 2 x 3 drum water tube boiler Working Pressure 45 kg/cm² Is a Report on Main Boilers now forwarded? Yes

012624-012630-0249

Is ☒ a Donkey ☒ an Auxiliary Boiler fitted? ☒ Yes ☒ If so, is a report now forwarded? ☒ Yes
Is the donkey boiler intended to be used for domestic purposes only? ☒ No
Plans. Are approved plans forwarded herewith for Shafting 9-3-53 Main Boilers 19-12-52 Auxiliary Boilers 1-12-52 Donkey Boilers 1-12-52
(If not, state date of approval)
Superheaters 19-12-52 General Pumping Arrangements 4-12-53 Oil Fuel Burning Arrangements 21-4-53
Geared turbines situated aft. Have torsional vibration characteristics of system been approved? ☒ Yes Date of approval 30-4-53

SPARE GEAR.

Has the spare gear required by the Rules been supplied? ☒ Yes
State the principal additional spare gear supplied. Bearing bushes for each reduction gear and each rotor.
Bolts, reamer bolts, studs & nuts for turbine casing. Pads for HP LP turbine thrust & main thrust. 2 - propeller blades. 1 - screw shaft with continuous line.
(LLOYD'S NO. K-F 1325)

THE MARINA SHIPBUILDING AND
ENGINEERING COMPANY, LTD.

Ishikawajima H. Industries Co., Ltd.

The foregoing is a correct description.

Manufacturer.

Dates of Survey while building
During progress of work in shops - 1952: Aug. 12, Sep. 2, 10, 12, Oct. 7, Nov. 5, 11, 18, 21, 27, 28, Dec. 2, 5, 9, 13, 17, 19, 26.
During erection on board vessel - 1953: Jan. 4, 6, 9, 14, 16, 20, 23, 26, 27, 30, 31, Feb. 3, 4, 9, 11, 12, 13, 21, 24, Mar. 2, 4, 6, 10, 13, 17, 18, 20, 21, 24, 27, 31, April 1, 3, 6, 7, 8, 10, 14, 17, 19, 24, 26, 28, May 2, 4, 6, 10, 13, 15, 17, 20, 22, 27, 28, 30, June 4, 9, 11, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, July 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, Aug. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, Sept. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, Oct. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, Nov. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, Dec. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 1953: April 15, 20, May 13, 17, 20, June 10, 13, 16, 19, 22, 24, 26, March 24, (YOKOHAMA) (Kobe) (Total)
Total No. of visits HP 20-3-53 HP 6-3-53 HP 6-4-53 55 78 133

Dates of Examination of principal parts - Casings LP 20-3-53 Rotors LP 17-3-53 Blading LP 6-4-53 Gearing 27-3-53
Wheel shaft 27-3-53 Thrust shaft - Intermediate shafts 9-3-53 Tube shaft - Screw shaft 27-3-53 (Japan)

Propeller 25-2-53 Stern tube 28-2-53 Engine and boiler seatings 20-4-53 Engine holding down bolts 15-4-53
Completion of fitting sea connections 9-3-53 Completion of pumping arrangements 13-6-53 Boilers fixed 24-3-53 Engines tried under steam 19-6-53

Main boiler safety valves adjusted 46.2 kg/cm² (S) 42.2 kg/cm² Thickness of adjusting washers -
HP Ni-Cr-Mo T 47.6 B 50.4 Tan 49.9 Rad. 50.8 T/0" Identification Mark HP Y 1521-B
Rotor shaft, Material and tensile strength LP Forged steel T 38.9 B 36.2 T/0" Identification Mark LP Y 2692-B

Flexible Pinion Shaft, Material and tensile strength LP Ni-Cr-Mo T 48.7 B 45.6 T/0" Identification Mark HP Y 2694-B
HP 46.2 46.2 45.5 45.5 2ND HP 51.6 52.2 53.4 Identification Mark LP Y 2695-A
1ST LP 48.3 49.7 49.7 49.5 RIM LP 48.4 50.9 51.5 49.8 1ST LP Y 2695-C 2ND LP Y 2695-D

Pinion shaft, Material and tensile strength Ni-Cr-Mo 1ST LP 48.3 49.7 49.7 49.5 2ND HP 51.6 52.2 53.4 Identification Mark LP Y 2695-A
2ND Pinion Shaft Forged steel HP 30.1 30.0 Y 2697-L 1ST C 0.30 S 0.32 Mn 0.64 P 0.030 S 0.024 Ni 1.71 Cr 0.71 Mo 0.34
Shaft LP 30.3 30.8 Y 2696-C; Chemical analysis 2ND C 0.35 S 0.36 Mn 0.63 P 0.018 S 0.027 Ni 1.81 Cr 0.80 Mo 0.36

If Pinion Shafts are made of special steel state date of approval of chemical analyses, physical properties and heat treatment 9-3-53
1st Reduction Wheel Shaft, Material and tensile strength Forged steel HP 28.6 28.3 T/0" Identification Mark HP Y 4204
LP 28.3 28.3 T/0" Identification Mark LP Y 4205

Wheel shaft, Material Forged steel Identification Mark Y 2698-C Thrust shaft, Material - Identification Mark -
Intermediate shafts, Material O.H. Steel Identification Marks K-F 1238 Tube shaft, Material - Identification Marks -

Screw shaft, Material O.H. Steel Identification Marks K-F 1325 (Spare) Steam Pipes, Material Cold drawn seamless steel test pressure 82, 90 kg/cm²

Date of test 1953: April 2, 27, 28, 30, May 4, 29, June 11 Is an installation fitted for burning oil fuel? ☒ Yes
Is the flash point of the oil to be used over 150°F? ☒ Yes Have the requirements of the Rules for the use of oil as fuel been complied with? ☒ Yes

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

Is this machinery a duplicate of a previous case? ☒ Yes If so, state name of vessel "YUHO MARU"

General Remarks. (State quality of workmanship, opinions as to class, &c.) This Turbine has been constructed under the supervision of the Society's Surveyors in accordance with Approved plans and the Rules. The workmanship and materials have been found satisfactory.

The turbine has been tested in the shop under no load condition and found in good order. It is submitted that this engine is eligible for classification with this Society with the notation of +LMC when satisfactorily installed in the vessel.

The machinery has now been satisfactorily installed on board and tested under full working condition and found satisfactory.

In our opinion the machinery of this vessel is worthy of a record of +LMC 6.53, B.S. 7.53, and T.S. (CL) 7.53.

The amount of Entry Fee £4364.000 When applied for 27. AUG. 1953

Donkey Boiler Fee £ : When received.

Travelling Expenses (if any) £ FRIDAY 16 OCT 1953

Committee's Minute Assigned +LMC 6.53 Fitted for oil fuel 6.53 F.P. above 150°F.

2WTB 640 lb. (Sp 583 lb.) DB 100 lb. CL.

YOKOHAMA KOBE

Engine Surveyor to Lloyd's Register of Shipping.

Lloyd's Register Foundation