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Report on Steam Turbine Machinery.

No. FE-6715

15 JAN 1960

Received at London Office
Port of KOBE
Date, First Survey 4th Aug., 1958 Last Survey 22nd October, 1959.
(Number of Visits 121)
on the ~~Double~~ Single Steel Steam Screw Vessel "GEKKO MARU"
Built at Kobe, Japan By whom built Kawasaki Dockyard Co., Ltd. Yard No. 972 When built 1959-10
Engines made at Kobe, Japan By whom made Kawasaki Dockyard Co., Ltd. Engine No. T-366 When made 1959-5
Boilers made at Kobe, Japan By whom made Kawasaki Dockyard Co., Ltd. Boiler No. 2212 When made 1959-6
Shaft Horse Power Maximum 16,500 Owners Tokyo Tanker Co., Ltd. Port belonging to Tokyo
Service 15,000
M.N. as per Rule 3,300 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes
Trade for which Vessel is intended Ocean going

STEAM TURBINE ENGINES, &c.—Description of Engines. 2-Turbines double reduction geared to 1 screw shaft.

No. of Turbines Ahead 2 Astern 1
No. of primary pinions to each set of reduction gearing HP-1 LP-1
direct coupled to Alternating Current Generator phase periods per second rated Kilowatts Volts at revolutions per minute;
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 9	-	8	3
Reaction Blading	No. of stages	-	-	-
	No. of rows in each stage	-	-	-
Shaft Horse Power at each turbine	H.P. 7,950 I.P. - L.P. 8,550	Revolutions per minute, at full power, of each Turbine Shaft HP=277.128mm LP=375.278mm	H.P. 5683 I.P. - L.P. 3604	1st reduction wheel LP 768 main shaft LP 682
Rotor Shaft diameter at journals	H.P. 104.7, 119.7mm I.P. - L.P. 199.6, 119.6mm	Pitch Circle Diameter 1st pinion HP=581.969mm 2nd pinion LP=655.870mm	HP=2,049.593mm LP=1,986.085mm main wheel 4,064.546mm	1st reduction wheel LP 275x2 main wheel 565 x 2 mm 1st reduction wheel LP 270x2 mm
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings	HP 130-50mm Hole 1st LP 160x50mm Hole	External Internal	HP 815, LP 825mm HP 339.6mm HP 399.6mm HP 390mm LP 290mm	main wheel 945mm 1st LP 262.194 HP 360.374mm HP 556.173 LP 630.074mm
Flexible Pinion Shafts, diameter at bearings	HP 180 2nd LP 280	1st LP 399.6mm main 619.5mm	1st LP 450mm main 850mm	Generator Shaft, diameter at bearings - Propelling Motor Shaft, diameter at bearings -
Wheel Shafts, diameter at bearings	as per rule As approved as fitted 525mm	as per rule As approved as fitted 650mm	as per rule As approved as fitted 360mm	as per rule As approved as fitted 360mm
Tube Shaft, diameter	as per rule - as fitted -	Screw Shaft, diameter	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 32mm	Thickness between bushes	as per rule As approved as fitted 28mm	Is the after end of the liner made watertight in the propeller boss Yes
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 -				
Propeller, diameter 6,500mm Pitch 5,070mm No. of Blades 5 State whether Moveable Solid Total Developed Surface 18.59 square feet				
If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Yes				
Condenser Yes No. of Turbines fitted with astern wheels 1 Feed Pumps No. and size 3 - @ 9 M3/h. 56.2 kg/cm2 How driven Steam Turbine Driven				
Pumps connected to the Main Bilge Line No. and size 1 - 85/170 M3/h. 80/30M, How driven Electric Motor Driven				
Ballast Pumps, No. and size 1-100M3/hr. 25M, 1-120M/h. 88M Lubricating Oil Pumps, including Spare Pump, No. and size 2- @ 140M3/h. 35M				
Are two independent means arranged for circulating water through the Oil Cooler Yes				
and Boiler Rooms 6 - @ 4" dia.				
In Holds, &c. Chain Locker; 1-2", Aux. P.Room Aft.; 1-5", Main P.Room; 2-4", Forward E.R.; 2-2 1/2", Mid E.R.; 1-2 1/2"				
Main Water Circulating Pump Direct Bilge Suctions, No. and size 2, 14" dia.				
Bilges, No. and size 2 - @ 6" dia.				
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 to welded chest				
Are all Sea Connections fitted direct on the skin of the ship				
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				
What pipes pass through the bunkers F.P.Tk. ballast pipe through fore F.O. Tank				
How are they protected Extra heavy pipe with no joint.				
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				
Is it fitted with a watertight door				
worked from				

BOILERS, &c.—Total Heating Surface of Boilers 2006.4 M² (21597 ft²)

Is Forced Draught fitted Yes No. and Description of Boilers 2 - Water tube "D" type Working Pressure 690 p.s.i.
Is a Report on Main Boilers now forwarded? Yes

Is { a Donkey Boiler fitted? No If so, is a report now forwarded? -
{ an Auxiliary
Is the donkey boiler intended to be used for domestic purposes only 22-7-58
Plans. Are approved plans forwarded herewith for Shafting 4-11-58 Main Boilers 10-4-58 Auxiliary Boilers - Donkey Boilers -
(If not, state date of approval)
Superheaters 10-4-58, 27-3-58 General Pumping Arrangements 1-10-58 Oil Fuel Burning Arrangements 5-3-59
Geared turbines { Have torsional vibration characteristics of system been approved Yes Date of approval 3-3-58
situated aft. }

SPARE GEAR.

Has the spare gear required by the Rules been supplied Yes
State the principal additional spare gear supplied.
1 - Cast Iron 5 bladed solid propeller.
1 - Tail shaft with continuous brass liner (Marked KOB No. KT-F 1330 EI 28-4-59)
Each type of Labyrinth rings.

The foregoing is a correct description.

Managing Director of
Kawasaki Dockyard.
Manufacturer.

Dates of Survey while building
During progress of work in shops - 1958: Aug. 4, 6, 20, 22, 25, 29, Sept. 1, 5, 8, 10, 12, 16, 19, 22, 24, 29, Oct. 1, 6, 8, 10, 29, Nov. 4, 5, 10, 21, Dec. 1, 8, 24.
During erection on board vessel - 1959: Jan. 19, 28, 30, Feb. 2, 9, 16, 18, 19, 20, 23, 27, March 4, 6, 7, 9, 11, 13, 16, 20, 23, 25, 29, 30, 31, April 1, 5, 8, 13, 15, 16, 17, 24, 25, 27, May 8, 11, 14, 18, 19, 20, 22, 25, 27, 28, 29, June 1, 3, 8, 19, 22, 24, 26, 29, July 1, 6, 8, 17, 20, 24, 27, 29, 31, Aug. 3, 7, 12, 19, Oct. 19
Total No. of visits 121 HP 23-3-59 HP 16-4-59 HP 16-4-59 1st 19-2-59
Dates of Examination of principal parts - Casings LP 31-3-59 Rotors LP 24-4-59 Blading LP 24-4-59 Gearing 2nd 13-16-3-59

Wheel shaft 16-3-59 Thrust shaft 29-10-58 Intermediate shafts 3-6-59 Tube shaft - Screw shaft 25-5-59
Propeller 7-3-59 Stern tube 3-6-59 Engine and boiler seatings 23-4-59 Engine holding down bolts 28, 31-7-59

Completion of fitting sea connections 8-6-59 Completion of pumping arrangements 30-9-59 Boilers fixed 18-7-59 Engines tried under steam 22-10-59
Main boiler safety valves adjusted 11-8-59 Thickness of adjusting washers Drum: F16 A18 F17 A19 Sup: 15 19
Stb'd Boiler Pt. B. St. B. Pt. B.

Rotor shaft, Material and tensile strength HP Steel forging T. 83.4 T. 79.2 R. 80.5 Identification Mark LP Y-12712
LP 70.3 68.2 67.6 kg/mm² LP Y-12735

Flexible Pinion Shaft, Material and tensile strength HP Steel forging T. 83.7 B. 81.4 Identification Mark HP Y-12712
LP 59.2 60.3 kg/mm² LP Y-12735

Pinion shaft, Material and tensile strength 1st HP Ni. Mo. V S.F. L.T. 79.5 L.B. 80.2 T. 80.0 2nd * (1) Identification Mark HP Y-12709
LP 78.2 76.4 77.1 (see below) LP Y-12247

2nd HP Y-12689 ; Chemical analysis 1st LP 28.33 .48 .014 .014 3.34 .12 .33 .05 2nd (see below)
LP Y-12699 0. Si. Mn P S Ni Cr Mo V *(2)

If Pinion Shafts are made of special steel state date of approval of chemical analyses, physical properties and heat treatment 7-6-57
HP Carbon Steel 45.5 - 48.5 kg/mm² Identification Mark 1st HP Y-12691
1st Reduction Wheel Shaft, Material and tensile strength LP Carbon Steel 45.5 - 48.5 LP Y-12692

Wheel shaft, Material Carbon Steel Identification Mark Y-12714 Thrust shaft, Material Carbon Steel Identification Mark Y-12246
Kob KW-F3072

Intermediate shafts, Material F.S. Identification Marks KW-F3034 Tube shaft, Material - Identification Marks -
Kob KT-F1327

Screw shaft, Material F.S. Identification Marks Steam Pipes, Material Cr. Mo. Steel Test pressure 94 kg/cm² (13)
1959

Date of test May, 18, 20, 22, 25, 27, 29 June, 18, 19, 22, 24, 26, 29 Is an installation fitted for burning oil fuel Yes
July 1, 6, 8, 10, 15, 17, 20, 24, 27, 29, 31 Aug. 3, 7, 12, 19

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
15-20 lbs & 1-100 lbs portable frath 12-water hose complings (12)

Full description of Fire Extinguishing Apparatus fitted in machinery spaces 12-Hose reels each containing 60ft x 1 1/2" hose 4-san boxes with
CO2 total flooding in E.R. & B.R.

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

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

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

General Remarks. (State quality of workmanship, opinions as to class, &c.) This machinery has been constructed under Special Survey
in accordance with the Rules, approved plans and Secretary's letters. The materials and workmanship have been found
satisfactory.

The turbine has been tested in the shop under no load condition and found satisfactory.
These boilers and main and auxiliary machineries have been fitted on board the steam tanker "GEKKO MARU" in a proper ma
and found satisfactory when tested at sea under full working conditions and eligible in our opinion for classification
records of +LMC10, 59 MBS10, 59 TS(CL)10, 59 SPS10, 59 O.F.10, 59.

The torsional rebration characteristics of the main propelling machinery were verified by torsigraph taken during sea
trial and confirmed that no gear hammer nor rough running was observed at around 46 R.P.M.

* (1) 2nd
HP) Ni. Mo. V. S. F. L. T. 77.0 L. B. 77.0 T. 77.0
LP 79.4 79.1

* (2) 2nd C Si Mn P S Ni Cr MO
HP .26 .31 .51 .014 .011 3.54 .12 .34
LP .29 .34 .54 .016 0.15 3.48 .25 .33

The amount of Entry Fee ... £ : : When applied for
Special ... £ : : 10
Donkey Boiler Fee ... £ : : When received
Travelling Expenses (if any) £ : : 10

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRIDAY 19 FEB 1960
Assigned See Rpt. 1

Lloyd's Register
Foundation