

REPORT ON STEAM TURBINE MACHINERY. No. 2028

Received at London Office

Rpt. 4a.

Date of writing Report 8th April 1935 When handed in at Local Office 8th April 1935 Port of NAGASAKI.
 No. in Survey held at NAGASAKI. Date, First Survey 12th March 34 Last Survey 30th March 1935
 Reg. Book. 90527 on the Steel Twin Screw Steamer "NEKA MARU" (Number of Visits 178.)
 Tons ^{Gross} 6783.97 _{Net} 3911.40
 Built at Nagasaki By whom built Mitsubishi Jukogyo K. K. Yard No. 594 When built 1935-3.
 Engines made at Nagasaki. By whom made Mitsubishi Jukogyo K.K. Engine No. 594 When made 1935
 Boilers made at Nagasaki. By whom made Mitsubishi Jukogyo K.K. Boiler No. 594 When made 1935
 Shaft Horse Power at Full Power 6000. Owners Osaka Shosen Kabushiki Kaisha. Port belonging to Osaka.
 Nom. Horse Power as per Rule 1225. Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted Yes
 Trade for which Vessel is intended Japan to Dairen.

STEAM TURBINE ENGINES, &c.—Description of Engines Mitsubishi Zoelly Turbine.

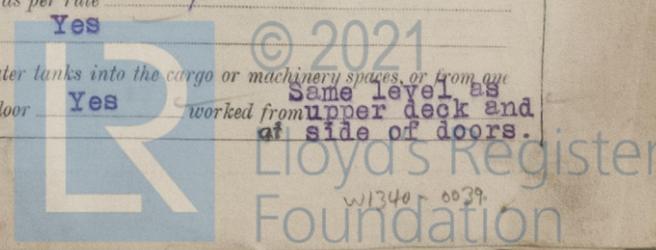
No. of Turbines 4 ^{Ahead} 4 ^{Astern} 4 ~~double reduction geared~~ to 2 propelling shafts. No. of primary pinions to each set of reduction gearing 2
 direct coupled to { Alternating Current Generator - phase - periods per second } rated - Kilowatts - Volts at - revolutions per minute;
 for supplying 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.		
	HEIGHT OF BLADES.	MEAN DIAMETER	NO. OF ROWS.	HEIGHT OF BLADES.	MEAN DIAMETER	NO. OF ROWS.	HEIGHT OF BLADES.	MEAN DIAMETER	NO. OF ROWS.	HEIGHT OF BLADES.	MEAN DIAMETER	NO. OF ROWS.
1ST EXPANSION	15 m/m	670 m/m	1	20 m/m	750 m/m	1 Mov.	31 m/m	1100 m/m	1	42 m/m	1100 m/m	Mov
2ND "	15 "	670 "	1	26 "	750 "	1 Fix	45 "	1100 "	1	55 "	1100 "	Fix
3RD "	15 "	670 "	1	35 "	750 "	1 Mov.	70 "	1100 "	1	68 "	1100 "	Mov
4TH "	15 "	690 "	1				100 "	1100 "	1			
5TH "	17 "	710 "	1				142 "	1100 "	1			
6TH "	22 "	730 "	1				176 "	1100 "	1			
7TH "	30 "	750 "	1									
8TH "												
9TH "												
10TH "												
11TH "												
12TH "												

Shaft Horse Power at each turbine { H.P. 1560 I.P. - L.P. 1440 } Revolutions per minute, at full power, of each Turbine Shaft { H.P. 4488 I.P. - L.P. 3056 } 1st reduction wheel 630 main shaft 140
 Rotor Shaft diameter at journals { H.P. 140 m/m I.P. - L.P. 200 m/m } Pitch Circle Diameter { 1st pinion HP 6.8077" LP 9.9989" 2nd pinion 16.0002" } 1st reduction wheel 48.5052" main wheel 72.0010" Width of Face { 1st reduction wheel 380 m/m + 75 m/m gap main wheel 870 m/m + 80 m/m gap }
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 362.5 m/m 2nd pinion 660 m/m } 1st reduction wheel Fore 357.5 m/m Alt. 332.5 m/m main wheel 695 m/m
 Flexible Pinion Shafts, diameter { 1st - 2nd 150 m/m } Pinion Shafts, diameter at bearings { External 1st 100 m/m 2nd 280 m/m Internal 1st - 2nd 175 m/m } diameter at bottom of pinion teeth { HP 6.2311" LP 9.4223" 2nd 15.0768" }
 Wheel Shafts, diameter at bearings { 1st 280 m/m 2nd 350 m/m } diameter at wheel shroud, { 1st 1135 m/m 2nd 1705 m/m } Generator Shaft, diameter at bearings - Propelling Motor Shaft, diameter at bearings -
 Intermediate Shafts, diameter { as per rule 282.2 m/m as fitted 300 m/m } Thrust Shaft, diameter at collars { as per rule 296.3 m/m as fitted 315 m/m } Tube Shaft, diameter { as per rule - as fitted - }
 Screw Shaft, diameter { as per rule 307.5 m/m as fitted 335 m/m } Is the screw shaft fitted with a continuous liner { Yes } Bronze Liners, thickness in way of bushes { as per rule 17.1 m/m as fitted 21 m/m }
 Thickness between bushes { as per rule 12.8 m/m as fitted 15.16 m/m } 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 { 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 { Yes } 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 - Length of Bearing in Stern Bush next to and supporting propeller 1400 m/m
 Propeller, diameter 3650 m/m Pitch 4060 m/m No. of Blades 4 State whether Movable Fixed Total Developed Surface 10.4635 square meters.

If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine - Can the H.P. or I.P. Turbine exhaust direct to the Condenser - No. of Turbines fitted with astern wheels 4 Feed Pumps { No. and size 3 Recp:- 2 off 50 M³/H. 1 off 12 M³/H. How driven Steam. }
 Pumps connected to the Main Bilge Line { No. and size 3 Recp:- 1 off 125 M³/H. 1 off 88 M³/H. 1 off 50 M³/H. How driven Steam. }
 Ballast Pumps, No. and size 2 Recp:- 125 M³/H. each. Lubricating Oil Pumps, including Spare Pump, No. and size 2 Recp:- 110 M³/H. each.
 Are two independent means arranged for circulating water through the Oil Cooler Yes Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Engine and Boiler Room 6 @ 90 m/m: 1 @ 50 m/m: in Cofferdam: 1 @ 50 m/m for Bilge hat.
 In Holds, &c. Chain locker 1 @ 65 m/m: No.1 Hold 2 @ 80 m/m: No.2 Ho/d 2 @ 80 m/m: No.3 Hold 3 @ 80 m/m: No.4 Hold 2 @ 80 m/m: Tunnel Well 1 @ 80 m/m: Stern Bilge 1 @ 50 m/m:
 Main Water Circulating Pump Direct Bilge Suctions, No. and size 2 @ 300 m/m Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 2 @ 130 m/m 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
 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 Both
 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 Bilge and ballast water pipes. How are they protected Covered with bunker board.
 What pipes pass through the deep tanks - 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 Same level as upper deck and side of doors.

Water Capacity Tons. 32.4
118.7
22.2
1.8.11.17
23.27. Dec
2.26.30.
 Visits 66.



BOILERS, &c.—(Letter for record **S**) Total Heating Surface of Boilers **15078 sq.ft.**
 Is Forced Draft fitted **Yes** No. and Description of Boilers **6 Cylindrical Sing. Ended.** Working Pressure **225 lbs.**
 Is a Report on Main Boilers now forwarded? **Yes** If so, is a report now forwarded? /
 Is a Donkey (an Auxiliary) Boiler fitted? **No.**
 Plans. Are approved plans forwarded herewith for Shafting **17-4-34** Main Boilers **12-12-33** Auxiliary Boilers / Donkey Boilers /
 (If not state date of approval) **7-6-34**
 Superheaters **15-3-34** General Pumping Arrangements **4-1-34** Oil Fuel Burning Arrangements /
 Spare Gear. State the articles supplied:— **As per Rules, and in Additions.**
 (See separate list, forwarded under separate cover).

NAGASAKI WORKS, MITSUBISHI JUKOGYO KABUSHIKI KAISHA.
T. Inagaki Manufacturer.
GENERAL MANAGER.

The foregoing is a correct description,

Dates of Survey while building	During progress of work in shops --	1934: Mar 12, 16, 22, 31 Apr 4, 5, 12, 23 May 3, 8 Jun 2, 9, 13, 18, 19, 21, 22, 25, 26, 27 Jul 3, 4, 6
	During erection on board vessel ---	1934: Mar 10, 13, 21, 23, 24, 30, 31 Apr 4, 6, 7, 8, 9, 11, 15, 16, 17, 18, 20, 21, 22, 24, 25, 28, 29, 30, 31 May 1, 2, 3, 4, 5, 6, 10, 11, 12, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31 Jun 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 Jul 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 Sep 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
	Total No. of visits	178

Dates of Examination of principal parts—Casings **5-6-12-34** Rotors **8-9-34 to 19-12-34** Blading **12-1-35** Gearing **25-9-34 to 21-1-35**
 Wheel shaft **29-10-34** Thrust shaft **31-10-34** Intermediate shafts **31-10-34 & 12-11-34** Tube shaft / Screw shaft **13-11-34**
 Propeller **13-11-34** Stern tube **12-11-34** Engine and boiler seatings **21-12-34** Engine holding down bolts **25-2-35**
 Completion of pumping arrangements **1-2-35** Boilers fired **4-2-35** Engines tried under steam **9-3-35**
 Main boiler safety valves adjusted **26-2-35** Thickness of adjusting washers **Lock nuts fitted.**
 Rotor shaft, Material and tensile strength **H.P.: Nickel steel, above 38 tons/sq.in.** Identification Mark **L.No. 1157 HDB 1097 TK**
L.P.: Special steel 34 - 38 " Identification Mark **L.No. 1990 TK 1991 TK.**
 Flexible Pinion Shaft, Material and tensile strength **Nickel steel, above 40 tons/sq.in.** Identification Mark **L.No. 1084 HDB**
L.No. 5386 ADM.
 Pinion shaft, Material and tensile strength **Nickel steel, above 48 tons/sq.in.** Identification Mark **See below.**
 1st Reduction Wheel Shaft, Material and tensile strength **Special steel, 34 - 38 tons/sq.in.** Identification Mark **L.No. 4206 HDB 4205 HDB**
L.No. 4208 HDB 4209 HDB
 Wheel shaft, Material **Special steel** Identification Mark **L.No. 1918 HDB** Thrust shaft, Material **Ingot steel** Identification Mark **L.No. 1109 HDB**
 Intermediate shafts, Material **Ingot steel** Identification Marks **L.No. 1108 & 1108-A to H & J.** Identification Marks /
 Screw shaft, Material **Ingot steel** Identification Marks **L.No. 1122 TK** Steam Pipes, Material **Steel** Test pressure **48 Kg/cm²**
 Date of test **6-2-35 to 4-3-35.** Is an installation fitted for burning oil fuel **No**
 Is the flash point of the oil to be used over 150°F. / Have the requirements of the Rules for carrying and burning oil fuel been complied with /
 Is this machinery a duplicate of a previous case **Yes** If so, state name of vessel **"Kitsurin Maru" Nag. Rpt No. 2014.**

General Remarks (State quality of workmanship, opinions as to class, &c. **The Machinery of this vessel has been constructed under Special survey in accordance with the Rules, and Approved plans. The materials have been tested found efficient and the workmanship throughout is good.**
The Machinery has been efficiently installed on board, tried under full load, overload & manoeuvring conditions, with satisfactory results, afterwards the machinery was opened up examined and found in good order.

This case is eligible in our opinion to have the record of **LMC, 3-35** and "Tail shaft (CL)" fitted in the Register Book.
 Mean speed on trial **17.306 knots at 144.2 r.p.m.**
 Forging and casting certificates herewith.

Identification Marks for Pinion Shafts:— **H.P.: L.No. 5364. TK: 5361 HDB: 5374 HDB: 5375 TK: L.P.: L.No. 1477 TK: 5367 HDB: 5771 HDB: 1128 TK:**

The amount of Entry Fee	£ 6-0-0	When applied for,	1. 4. 19 35
Special	£ 163-5-0		
Donkey Boiler Fee	£ :	When received,	10. 4. 19 35
Travelling Expenses (if any)	£ :		

A. Buchanan / T. Kurihara
 Engineer Surveyor to Lloyds Register of Shipping.

Committee's Minute **FRI. 10 MAY 1935**
 Assigned **+ LMC 3.35**
J.D. C.L.



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