

## REPORT ON STEAM TURBINE MACHINERY

Received at London Office.....

DEC 1924

Date of writing Report 8<sup>th</sup> Nov 24 When handed in at Local Office 19 Port of Yokohama  
 No. in Survey held at Isurumi, Yokohama Date, First Survey April 25<sup>th</sup> Last Survey Oct 8<sup>th</sup> 19 24  
 Reg. Book. on the Steel Twin Screw Steamer "Bokuyo Maru" (Number of Visits 24)  
 Built at Isurumi, Yokohama By whom built Asano Shipbuilding Co Yard No. 39 When built Oct 1921  
 Engines made at U.S.A. By whom made Midwest Engineering Co Engine No. 1920  
 Boilers made at Isurumi, Yokohama By whom made Asano Shipbuilding Co Boiler No. 1924  
 Shaft Horse Power at Full Power 5600 Owners Tokyo Kisen Kaisha Port belonging to Yokohama  
 Nom. Horse Power as per Rule 922.6 Is Refrigerating Machinery fitted for cargo purposes ☒ Is Electric Light fitted ☒

STEAM TURBINE ENGINES, &c.—Description of Engines Double Reduction Compound Parsons Turbine No. of Turbines Ahead 4  
Astern 4  
 Direct coupled, single or double reduction geared to 2 propelling shafts. No. of primary pinions to each set of reduction gearing 2, direct coupled to ✓ phase  
✓ periods per second, Alternating Current Generator rated ✓ Kilowatts ✓ Volts at ✓ revolutions per minute; for supplying power for driving  
 Propelling Motors, ✓ Propelling Motors, Type ✓  
 rated ✓ Kilowatts ✓ Volts at ✓ revolutions per minute. Direct coupled, single or double reduction geared to ✓ propelling shafts.

## PARTICULARS OF TURBINE BLADING.

	H. P.			I. P.			L. P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	$5\frac{1}{8} - 0310$	$1' 2\frac{1}{4} - 063$	5				$2\frac{1}{4} - 0407$	$26\frac{1}{2} - 0815$	2			
2ND	$1\frac{1}{8} - 03675$	$1' 2\frac{3}{8} - 0735$	6				$2\frac{3}{8} - 040$	$27\frac{3}{8} - 080$	2		$2' 3\frac{3}{8} - .12$	1
3RD	$1\frac{1}{8} - 03825$	$1' 3\frac{1}{8} - 0765$	5				$3\frac{1}{2} - 0445$	$29 - 089$	2		$2' 4\frac{1}{8} - .123$	1
4TH	$1\frac{3}{8} - 0325$	$1' 3\frac{3}{4} - 065$	5				$4\frac{3}{8} - 05225$	$30\frac{3}{4} - 1045$	2		$2' 5\frac{1}{8} - .125$	1
5TH	$1\frac{1}{8} - 0385$	$1' 6\frac{1}{4} - 077$	3				$5 - 05557$	$32 - 1115$	2	$1.90625$	$2' 4\frac{1}{8} - .122$	1
6TH	$1\frac{1}{8} - 0365$	$1' 6\frac{3}{4} - 073$	3				$5 - 05375$	$32 - 1078$	1	$2.71875$	$2' 6\frac{1}{8} - .124$	1
7TH	$1\frac{7}{8} - 0445$	$1' 7\frac{3}{4} - 089$	3				$5 - 0530$	$32 - 1060$	1	$5.15695$	$2' 7\frac{1}{8} - .127$	1
8TH	$2\frac{3}{8} - 0425$	$1' 8\frac{3}{4} - 085$	3				$5 - 05305$	$32 - 1101$	1			

Shaft Horse Power at each turbine 2800 Revolutions per minute, at full power, of each Turbine Shaft 3600 1st reduction wheel 546  
 main shaft 90 Pitch Circle Diameter, 1st pinion 7.775 2nd pinion 15.70 1st reduction wheel 51.250 main wheel 93.30  
 Width of Face, 1st reduction wheel 7" main wheel 28" Distance between centres of pinion and wheel faces and the centre of the adjacent bearings,  
 1st pinion 29.5125 2nd pinion 54.5" 1st reduction wheel 3.5875 main wheel 7.45 Flexible Pinion Shafts, diameter 1st 5" 2nd ✓  
 Pinion Shafts, diameter at bearings External 1st 5" 2nd 14½" diameter at bottom of teeth of pinion 1st 7.375 2nd 14.70  
 Internal ✓  
 Wheel Shafts, diameter at bearings, 1st 12" main 14.25" diameter at wheel shroud, 1st 51.55" main 94.1"  
 Generator Shafts, diameter at bearings ✓ Propelling Motor Shafts, diameter at bearings ✓  
 Main Shafting, diameter of Tunnel Shafting as per rule 17.6 as fitted 13" diameter of Thrust Shafting as per rule 13.24 as fitted 13¼"  
 diameter of Screw Shaft as per rule 13½" as fitted 13½" Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes 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 joints burned ✓ 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 appliance fitted at the after end of the shaft to permit of it being efficiently  
 lubricated ✓ Length of Stern Bush 5' 2" Diameter of Propeller 15' 9"  
 Pitch of Propeller 17' 10" No. of Blades 4 State whether Moveable Yes Total Surface 764 square feet. If Single Screw, are  
 arrangements made so that steam can be led direct to the L.P. Turbine, and either the H.P. or I.P. Turbine can exhaust direct to the Condenser ✓  
 No. of Turbines fitted with astern wheels 4 Total number of power driven Main and Auxiliary Pumps 24 1 @  $6\frac{1}{2} \times 6\frac{1}{2} \times 6"$   
 No. and size of Feed Pumps 3 @  $10\frac{1}{2} \times 8 \times 24$  How driven Steam No. and size of Pumps connected to the Main Bilge Line 3 1 @  $6\frac{1}{2} \times 6\frac{1}{2} \times 6"$   
 How driven Steam No. and size of Ballast Pumps 1 @  $9 \times 12 \times 10$  No. and size of Lubricating Oil Pumps, including 1 @  $9 \times 12 \times 10$   
 Spare Pump 3 @  $11 \times 9 \times 21$  Are two independent means arranged for circulating water through the Oil Cooler Yes No. and size of suction  
 connected to both Main Bilge Pumps and Auxiliary Bilge Pumps;—In Engine and Boiler Room 4 @  $3\frac{1}{2}$  ER and in Holds, &c. 3½"  
 No. and size of Main Water Circulating Pump Bilge Suctions 2 @  $8"$  No. and size of Donkey Pump Direct Suctions Yes  
 to the Engine Room Bilges 2 @  $6\frac{1}{2} \times 6 \times 6$  2 @  $3\frac{1}{2}$  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 connections with the sea direct on the skin of the ship Yes Are they Valves or Cocks Both  
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stowhold plates Yes Are the Discharge Pipes 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 are carried through the bunkers Fuel oil filling pipe, Skupper & sounding How are they protected Wood Casing  
 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 Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from ER top platform

BOILERS, &c.—(Letter for record S ) Total Heating Surface of Boilers 9844.4Is Forced Draft fitted Yes No. and Description of Boilers 4 Multitubular Working Pressure 200 lbs.



Is a Report on Main Boilers now forwarded? *Yes*

Is a Donkey Boiler fitted? *No*

If so, is a report now forwarded? *Yes*

Plans. Are approved plans forwarded herewith for Shafting (If not state date of approval)

Main Boilers *Yes* Auxiliary Boilers *Yes* Donkey Boilers *Yes*

Spare Gear. State the articles supplied:— 2 bolts & nuts for each rotor bearing. 2 bolts & nuts for main wheel bearing. 1 bolt & nut for pinion bearings. 1 set of coupling bolts. 28 bolts & nuts for joints of Gear Cases. 28 bolts & nuts for joints of turbine casings. 2 thermometers for oil circulating system. 1 set of bearing bushes for gear wheel shaft. 1 set of bearing bushes for rotor. 1 set of bearing bushes for each pinion shaft. Labyrinth packing for one unit. 2 sets of shoes for 23" Kingsbury thrust bearing. 12 thrust shoes & 2 collars for 13 1/2" Kingsbury thrust bearing. 12 thrust shoes & 2 collars for 8" Kingsbury thrust bearing. 2 sets of liners for adjusting blocks different size. 1 set of rack, teeth, & lubricating oil pump valves. 1 escape valve spring, each size. Quantity of assorted bolts & nuts. Steel bars of plate.

The foregoing is a correct description.

Manufacturer.

*M. Sagami*

2 propeller blades, left R. Tail shaft with nut. 182 Condenser tubes & spares for Auxiliary Machinery.

April 25<sup>th</sup> May 26<sup>th</sup>

Dates of Examination of principal parts— Casings June 2, 3, 7, 10. (Examination of parts). Rotors June 2, 3, 7, 10. Blading June 2, 3, 7, 10. Gearing June 3, 10. Wheel shaft June 3. Thrust shaft Apr 25. Tunnel shafts Apr 25. Screw shaft Apr 25. Propeller April 25. Stern tube 25<sup>th</sup> April. Engine and boiler seatings 25<sup>th</sup> July. May 26. Engines holding down bolts 25<sup>th</sup> July. Completion of pumping arrangements Sept 24<sup>th</sup>. Boilers fired. Engines tried under steam Oct 1. Main boiler safety valves adjusted Sept 24. Thickness of adjusting washers. Material and tensile strength of Rotor shaft Steel. L.R. certificate. Identification Mark on Do. Material and tensile strength of Flexible Pinion Shaft. Steel. A.C.C. Chicago 24 May 21 July 1920. Identification Mark on Do. Material and tensile strength of Pinion shaft. Steel. Reduction Gear teeth. L.R. certificate. Identification Mark on Do. Material and tensile strength of 1st Reduction Wheel Shaft. Steel. 29.3 tons & 28 tons. Chicago 25 Jan 1921. Identification Mark on Do. Material of Wheel shaft Steel. Identification Mark on Do. Material of Tunnel shafts Steel. Identification Marks on Do. (A.L.S. DATE) Material of Screw shafts Steel. Identification Marks on Do. Material of Steam Pipes Steel. Test pressure 600 lbs. Date of test 25 July 1924.

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 carrying and burning oil fuel been complied with *Yes*. Is this machinery a duplicate of a previous case *Yes*. If so, state name of vessel. *Genijo Maru*.

General Remarks (State quality of workmanship, opinions as to class, &c.)

The tunnel, shafting and tail shafting were made in Japan and installed to the satisfaction of the undersigned at this port. The turbine engines and double reduction gears were made at Indianapolis & Milwaukee to the approval of the Society's Surveyors in Chicago. (See Certificate dated Chicago May 24, July 21, 1920. Turbines & Chicago June 12, July 19, reduction gears.) And installed at this port to the satisfaction of the undersigned. The machinery is eligible in my opinion to have the record of M.S. 10.24.

The amount of Entry Fee ... £ 460 :  
Special ... £ 2076 :  
Donkey Boiler Fee ... £ :  
Travelling Expenses (if any) £ 71.50 :  
When applied for, 13 Oct 1924  
When received, 15.12.24

Committee's Minute FRI. 2 JAN 1925

Assigned + L.M. 10.24  
F.D. C.L.

*R.B. Atchelor*

Engineer Surveyor to Lloyd's Register of Shipping.



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