

# REPORT ON MACHINERY.

Port of **NAGASAKI.**

Received at London Office **TUE 20 JUN. 1916**

No. in Survey held at **NAGASAKI.** Date, first Survey 19<sup>th</sup> June 1916 Last Survey 4<sup>th</sup> May 1916

Reg. Book. on the **s.s. "Akita Maru"** (Number of Tons 115)

Master **U. Tanaka** Built at **Nagasaki** By whom built **Mitsubishi S. & C. Works.** Tons { Gross 3792 Net 2347 When built 1916

Engines made at **Nagasaki** By whom made **Mitsubishi Dockyard & Engine Works** when made 1916

Boilers made at **Nagasaki** By whom made **Do.** when made 1916

Registered Horse Power Owners **Nippon Yusen Kaisha** Port belonging to **Tokio**

Nom. Horse Power as per Section 28 **342** Is Refrigerating Machinery fitted for cargo purposes **No.** Is Electric Light fitted **Yes.**

ENGINES, &c.—Description of Engines **Triple Expansion** No. of Cylinders **3** No. of Cranks **3**

Dia. of Cylinders **23" 38" 64"** Length of Stroke **48"** Revs. per minute **86** Dia. of Screw shaft **14.5"** Material of screw shaft **Steel**

Is the screw shaft fitted with a continuous liner the whole length of the stern tube **No liner fitted** Is the after end of the liner made water tight in the propeller boss **Yes** If the liner is in more than one length are the joints burned **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 **Yes** Length of stern bush **5' 1 3/8"**

Dia. of Tunnel shaft **12.49"** Dia. of Crank shaft journals **13.116"** Dia. of Crank pin **14"** Size of Crank webs **8 3/4" x 19 5/8"** Dia. of thrust shaft under collars **13 1/2"** Dia. of screw **16.6"** Pitch of Screw **17.3"** No. of Blades **4** State whether moveable **Yes** Total surface **84.4 sq. ft.**

No. of Feed pumps **2** Diameter of ditto **4 1/2"** Stroke **22"** Can one be overhauled while the other is at work **Yes**

No. of Bilge pumps **2** Diameter of ditto **4 1/2"** Stroke **24"** Can one be overhauled while the other is at work **Yes**

No. of Donkey Engines **3** Sizes of Pumps **9 x 12 x 10, 7 x 5 x 7, 7 x 7 x 21** No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room **3 @ 3 1/2"** In Holds, &c. **No. 1 Hold 2 @ 3 1/2", No. 2 Hold 2 @ 3 1/2"**

No. of Bilge Injections **1** sizes **8"** Connected to condenser, or to circulating pump **Yes** Is a separate Donkey Suction fitted in Engine room & size **5"**

Are all the bilge suction pipes fitted with roses **Yes** Are the roses in Engine room always accessible **Yes** Are the sluices on Engine room bulkheads always accessible **None**

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 stokehold plates **Yes** Are the Discharge Pipes above or below the deep water line **Above**

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 **Bilge pipes** How are they protected **With steel plates**

Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times **Yes**

Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges **Yes**

Dates of examination of completion of fitting of Sea Connections **18<sup>th</sup> March 1916** of Stern Tube **16<sup>th</sup> March/16** Screw shaft and Propeller **18<sup>th</sup> March/16**

Is the Screw Shaft Tunnel watertight **Yes** Is it fitted with a watertight door **Yes** worked from **Upper deck**

OILERS, &c.—(Letter for record **S**) Manufacturers of Steel **Stewart & Lloyd Ltd.**

Total Heating Surface of Boilers **4394 sq. ft.** Is Forced Draft fitted **Yes** No. and Description of Boilers **2 Single ended, Scotch**

Working Pressure **200 lbs.** Tested by hydraulic pressure to **400 lbs.** Date of test **17<sup>th</sup> Feb. 1916** No. of Certificate **65**

Can each boiler be worked separately **Yes** Area of fire grate in each boiler **52.31 sq. ft.** No. and Description of Safety Valves to each boiler **2 Spring loaded** Area of each valve **9.62 sq. in.** Pressure to which they are adjusted **205 lbs.** Are they fitted with easing gear **Yes**

Smallest distance between boilers or uptakes and bunkers or woodwork **16 1/2"** Mean dia. of boilers **14' 0"** Length **11' 6"** Material of shell plates **Steel**

Thickness **1 5/16"** Range of tensile strength **285-32 tons** Are the shell plates welded or flanged **No.** Descrip. of riveting: cir. seams **Double Lap**

mg. seams **2 straps** Diameter of rivet holes in long. seams **1 3/8"** Pitch of rivets **9 1/2" & 12 1/2"** Lap of plates or width of butt straps **20 1/2"**

Per centages of strength of longitudinal joint rivets **88.6** Working pressure of shell by rules **212 lbs.** Size of manhole in shell **16" x 12"** plate **85.5**

Size of compensating ring **37" x 33"** No. and Description of Furnaces in each boiler **3 Morrison's suspension type** Material **Steel** Outside diameter **3' 9 1/2"**

Length of plain part top **9 1/2"** Thickness of plates crown **9 1/16"** Description of longitudinal joint **Welded** No. of strengthening rings **15** bottom **16**

Working pressure of furnace by the rules **217 lbs.** Combustion chamber plates: Material **Steel** Thickness: Sides **3/4"** Back **3/4"** Top **3/4"** Bottom **15/16"**

Pitch of stays to ditto: Sides **11" x 8"** Back **9 1/2" x 9"** Top **9 1/2" x 7"** If stays are fitted with nuts or riveted heads **Nuts** Working pressure by rules **233 lbs.**

Material of stays **Steel** Diameter at smallest part **1.73"** Area supported by each stay **91 sq. in.** Working pressure by rules **212 lbs.** End plates in steam space: Material **Steel** Thickness **1 9/32"** Pitch of stays **20" x 18"** How are stays secured **Double nuts and washers** Working pressure by rules **214 lbs.** Material of stays **Steel**

Diameter at smallest part **3 3/8"** Area supported by each stay **360 sq. in.** Working pressure by rules **221 lbs.** Material of Front plates at bottom **Steel**

Thickness **3 1/2"** Material of Lower back plate **Steel** Thickness **3 1/2"** Greatest pitch of stays **1' 1 3/4"** Working pressure of plate by rules **221 lbs.**

Diameter of tubes **3 1/2"** Pitch of tubes **4 1/2" x 4 3/8"** Material of tube plates **Steel** Thickness: Front **3 1/2"** Back **3 1/2"** Mean pitch of stays **10"**

Pitch across wide water spaces **1' 1 3/4"** Working pressures by rules **216 lbs.** Girders to Chamber tops: Material **Steel** Depth and thickness of girder at centre **10 1/2" x 7 1/2"** Length as per rule **31.9"** Distance apart **9 3/4"** Number and pitch of stays in each **3 @ 7"**

Working pressure by rules **214 lbs.** Superheater or Steam chest; how connected to boiler **By pipe** Can the superheater be shut off and the boiler worked separately **Yes** Diameter **10"** Length **10"** Thickness of shell plates **3/4"** Material **Steel** Description of longitudinal joint **Double Lap** Diam. of rivet holes **1 3/8"** Pitch of rivets **9 1/2"** Working pressure of shell by rules **212 lbs.** Diameter of flue **10"** Material of flue plates **Steel** Thickness **3/4"**

If stiffened with rings **Yes** Distance between rings **10"** Working pressure by rules **214 lbs.** End plates: Thickness **1 1/2"** How stayed **By pipe**

Working pressure of end plates **214 lbs.** Area of safety valves to superheater **3.14 sq. in.** Are they fitted with easing gear **No.**

**VERTICAL DONKEY BOILER—** Manufacturers of Steel

No.	Description		
Made at	By whom made	When made	Where fixed
Working pressure	tested by hydraulic pressure to	Date of test	No. of Certificate
Valves	No. of Safety Valves	Area of each	Pressure to which they are adjusted
If fitted with easing gear	If steam from main boilers can enter the donkey boiler		Date of adjustment
Material of shell plates	Thickness	Range of tensile strength	Descrip. of riveting long. seams
Dia. of rivet holes	Whether punched or drilled	Pitch of rivets	Lap of plating
Working pressure of shell by rules	Thickness of shell crown plates	Radius of do.	No. of stays to do.
Diameter of furnace Top	Bottom	Length of furnace	Thickness of furnace plates
Working pressure of furnace by rules	Thickness of furnace crown plates	Stayed by	
Diameter of uptake	Thickness of uptake plates	Thickness of water tubes	Dates of survey

**SPARE GEAR.** State the articles supplied:— As per Rule and in addition 1 crank shaft, 1 Propeller shaft, 2 Propeller blades, 1 Valve spindle, 2 Eccentric rods, 1 pair of Connecting rod brasses, 1 pair Crosshead brasses, 13 Jank ring bolts, 45 Condenser tubes, 12 Boiler tubes, 1 set valves seats for check valves, 1 set air pump valves, 1 set valves for Aux. pumps, 1 air pump rod, 1 Centrifugal pump spindle.

The foregoing is a correct description,  
**MITSUBISHI DOCKYARD & ENGINE WORKS**  
 General Manager, Manufacturer.

Dates of Survey while building: During progress of work in shops - June 19, 26, 28, 29, 30, July 9, 13, 24, 26, 28, 29, 31, Aug. 3, 4, 5, 7, 11, 12, 13, 16, 17, 18, 20, 23, 24, 25, 26, 27, 30, Sept. 1, 2, 10, 11, 14, 16, 17, 18, 20, 21, 22, 25, 29, 30, Oct. 1, 4, 5, 6, 11, 12, 16, 19, 20, 21, 29, Nov. 1, 3, 4, 8, 20, 22, 24, 27, 30, Dec. 1, 8, 20, 21, 22, 27, 28, 29, 1916, Jan. 7, 11, 19, 22, 26, 29, Feb. 2, 5, 8, 10, 14, 17, 21, 24, 28, March 2, 3, 6, 11, 16, 18, 20, 23, 25, 28, 29, 31, April 1, 4, 6, 8, 11, 12, 13, 15, 17, 18, 19, 20, 24, 29, May 4.

Total No. of visits 115

Is the approved plan of main boiler forwarded herewith Yes ✓

Dates of Examination of principal parts—Cylinders 11<sup>th</sup> Mar. 1916, Slides 18<sup>th</sup> Mar. 1916, Covers 19<sup>th</sup> Mar. 1916, Pistons 19<sup>th</sup> Mar. 1916, Rods 19<sup>th</sup> Mar. 1916, Connecting rods 18<sup>th</sup> Mar. 1916, Crank shaft 16<sup>th</sup> Oct. 1915, Thrust shaft 30<sup>th</sup> Sept. 1915, Tunnel shafts 19<sup>th</sup> Oct. 1915, Screw shaft 5<sup>th</sup> Feb. 1916, Propeller 11<sup>th</sup> Mar. 1916, Stern tube 14<sup>th</sup> Mar. 1916, Steam pipes tested 19<sup>th</sup> April 1916, Engine and boiler seatings 14<sup>th</sup> Mar. 1916, Engines holding down bolts 25<sup>th</sup> Mar. 1916, Completion of pumping arrangements 12<sup>th</sup> April 1916, Boilers fixed 29<sup>th</sup> March 1916, Engines tried under steam 29<sup>th</sup> April 1916, Main boiler safety valves adjusted 24<sup>th</sup> April 1916, Thickness of adjusting washers Jank nuts, Material of Crank shaft Steel, Identification Mark on Do. No. 120 ASW, Material of Thrust shaft Steel, Identification Mark on Do. No. 120 A.S.W., Material of Tunnel shafts Steel, Identification Marks on Do. No. 120 ASW, Material of Screw shafts Steel, Identification Marks on Do. No. 120 ASW, Material of Steam Pipes Solid drawn steel ✓, Test pressure 600 lb. per sq. in. ✓

**General Remarks** (State quality of workmanship, opinions as to class, &c. Boilers fitted with Leaky Superheaters, and a safety valve fitted to each one. The headers, superheater pipes, and all steam pipes subjected to the temperature of the superheated steam have been made of steel, and all stop valves, junction pieces &c. subjected to the temperature of the superheated steam have been made of cast steel. All the steel castings have been tested as required by the Rules. The headers and superheater pipes were tested by hydraulic pressure to 1000 lb. per sq. in., and the steam pipes, stop valves, junction pieces &c. to 600 lb. per sq. in. and found satisfactory. These Engines and Boilers have been constructed under Special Survey, in accordance with the Rules, and of good materials and workmanship. They have been securely fitted on board, and have been satisfactorily tried under steam. The machinery of this vessel is eligible, in my opinion, for the record **LMC 5.16** in the Register Book.

Mean speed of 6 Runs on Trial when 1/3<sup>rd</sup> Loaded = 13.969 knots.

The amount of Entry Fee..	£ 3 : 0 :	When applied for,
Special .. .. .	£ 55 : 13 : 0	19 <sup>th</sup> May 1916
Donkey Boiler Fee .. .. .	£ :	When received,
Travelling Expenses (if any) £	:	20 <sup>th</sup> May 1916

As submitted that this vessel is eligible for THE RECORD + LMC 5.16. F.L.  
 A.S. Williamson  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping

Certificate (if required) to be sent to the Surveyors are requested not to write on or below the space for Committee's Minute.

Committee's Minute TUE. JUN. 27. 1916  
 Assigned + LMC 5.16 J.D

