

Rpt. 4a.

REPORT ON MACHINERY

Received at London Office

Date of writing Report *2nd March 1921* When handed in at Local Office *5/3/1921* Port of *West Hartlepool*
 No. in Survey held at *West Hartlepool* Date, First Survey *10th Oct. 1919* Last Survey *1st March 1921*
 Reg. Book. *60737* on the *S.S. "Nagina"* (No 941) (Number of Visits *128*)

Master *By whom built* *Sunderland Shipyard of W. Gray* When built *1921*
 Engines made at *West Hartlepool* By whom made *Central Marine Engine Works Ltd* When made *1921*
 Boilers made at *ditto* By whom made *ditto* when made *1921*
 Registered Horse Power *NHP for fees = 769* Owners *British India & Nav. Co. Ltd* Port belonging to *Glasgow*
 Shaft Horse Power at Full Power *3500* Is Refrigerating Machinery fitted for cargo purposes *Is Electric Light fitted* *yes*

URBINE ENGINES, &c.—Description of Engines *Double reduction geared turbines* of Turbines *2*
 Diameter of Rotor Shaft Journals, H.P. *4 1/2"* L.P. *5 1/2"* Diameter of Pinion Shaft *1st red 2 1/2"* *2nd red 1 3/2"*
 Diameter of Journals *1st red 4 1/2"* *2nd red 10 1/2"* Distance between Centres of Bearings *2nd red 6-1 1/2"* Diameter of Pitch Circle *1st red 10-4 1/2"* *2nd red 16-6 1/2"*
 Diameter of Wheel Shaft *1st red 15"* Distance between Centres of Bearings *6-7"* Diameter of Pitch Circle of Wheel *1st red 56-6 1/2"* *2nd red 84-5 7/9"*
 Width of Face *2nd red 38-5"* Diameter of Thrust Shaft under Collars *15 1/4"* Diameter of Tunnel Shaft *as per rule 13-66"*
 No. of Screw Shafts *One* Diameter of same *as per rule 15-1"* Diameter of Propeller *17-9"* Pitch of Propeller *15-9"*
 No. of Blades *4* State whether Moveable *yes* Total Surface *114 Sq. ft.* Diameter of Rotor Drum, H.P. *as fitted 14 1/2"* L.P. *as fitted 14 1/2"*
 Thickness at Bottom of Groove, H.P. *✓* L.P. *✓* Astern *✓* Revs. per Minute at Full Power, Turbine *H.P. 3417* Propeller *88*
L.P. 2441

PARTICULARS OF BLADING.

	H.P. Impulse.			L.P. Reaction			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.
ST EXPANSION	1 1/4"	2'-7 1/2"	2	2 3/8"	2'-8-17"	4	1 1/4"	2'-7 1/2"	1 impulse
ND	1 5/16"	2'-8 1/16"	1	3 1/16"	2'-9-5 1/4"	4	1 5/16"	2'-8 1/2"	1
RD	1 3/16"	2'-8 1/16"	1	4"	2'-11-4"	4	1 3/16"	3'-7 1/8"	1
TH	1 5/8"	2'-8 1/8"	1	2 3/4"	3'-9-9"	2	2 3/8"	3'-8 3/8"	1
TH	1 5/8"	2'-8 1/2"	1	3 1/2"	3'-11-3 9/16"	2	1 5/16"	2'-11-0 25/32"	1 reaction
TH	2 1/2"	2'-8 1/2"	1	4"	4'-0-3 3/8"	1	1 5/8"	3'-0-11"	1
TH				4 3/4"	4'-1-8 7/16"	1	2 5/8"	3'-1-5 3/8"	1
TH				5 3/8"	4'-3-6 1/16"	1	2 5/8"	3'-1-5 3/8"	1
TH				6 3/4"	4'-5-8 1/4"	1	2 5/8"	3'-1-5 3/8"	1
TH				6 3/4"	4'-5-8 1/4"	1	2 5/8"	3'-1-5 3/8"	1

No. and size of Feed pumps *See list of pumps*No. and size of Bilge pumps *attached*

No. and size of Bilge suction in Engine Room *Five of 3 1/2" & two of 3 1/2" in oil bilge 103' Inland Well*
In Holds, &c. 2 of 3 1/2" in each hold. In dup tank 2 of 2 1/2"

No. of Bilge Injections *1* sizes *11"* Connected to condenser, or to circulating pump *C.P.* Is a separate Donkey Suction fitted in Engine Room & size *3 1/2"*
 Are all the bilge suction pipes fitted with roses *yes* Are the roses in Engine room always accessible *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 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*
 Are the pipes carried through the bunkers *none* How are they protected *yes*
 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*
 Is the Screw Shaft Tunnel watertight *yes* Is it fitted with a watertight door *yes* worked from *upper platform*

BOILERS, &c.—(Letter for record *S*) Manufacturers of Steel *J. Spencer & Sons*
 Total Heating Surface of Boilers *10,000 sq. ft.* Is Forced Draft fitted *yes* No. and Description of Boilers *4 single ended*
 Working Pressure *225 lb.* Tested by hydraulic pressure to *450 lb.* Date of test *18-6-20* No. of Certificate *3576*
 Can each boiler be worked separately *yes* Area of fire grate in each boiler *61.75 sq. ft.* No. and Description of Safety Valves to *4*
 On each boiler *2 direct spring* Area of each valve *9.62 sq. ft.* Pressure to which they are adjusted *227 lb.* Are they fitted with easing gear *yes*
 Smallest distance between boilers or uptakes and bunkers or woodwork *2'-6"* Mean dia. of boilers *15'-3"* Length *11'-6"* Material of shell plates *Steel*
 Thickness *1 1/32"* Range of tensile strength *28/30* Are the shell plates welded or flanged *yes* Descrip. of riveting: cir. seams *J.R. & S.*
 Rivets *J.R. & S.* Diameter of rivet holes in long. seams *1 5/8"* Pitch of rivets *11"* Lap of plates or width of butt straps *1'-11 3/4"*
 Percentages of strength of longitudinal joint *88* Working pressure of shell by rules *241* Size of manhole in shell *20" x 16"*
 Size of compensating ring *3'-3 1/2" x 2'-11 1/2"* No. and Description of Furnaces in each Boiler *3 Deighton* Material *Steel* Outside diameter *4'-1 1/8"*
 Length of plain part *top 23"* Thickness of plates *bottom 32"* Description of longitudinal joint *welded* No. of strengthening rings *✓*
 Working pressure of furnace by the rules *244* Combustion chamber plates: Material *Steel* Thickness: Sides *23/32"* Back *23/32"* Top *23/32"* Bottom *1 1/16"*
 Thickness of stays to ditto: Sides *9 1/8" x 7 3/4"* Back *8 5/8" x 8"* Top *9 1/4" x 7 3/4"* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *245*
 Material of stays *Steel* Diameter at smallest part *1.79"* Area supported by each stay *9 1/4" x 7 3/4"* Working pressure by rules *228* End plates in steam space *Steel*
 Material *Steel* Thickness *1 3/8"* Pitch of stays *20" x 19 1/2"* How are stays secured *on & w* Working pressure by rules *229* Material of stays *Steel*
 Diameter at smallest part *8.48"* Area supported by each stay *19 1/2" x 19 1/2"* Working pressure by rules *232* Material of Front plates at bottom *Steel*
 Thickness *1 3/32"* Material of Lower back plate *Steel* Thickness *1 5/16"* Greatest pitch of stays *14" x 8"* Working pressure of plate by rules *234*
 Diameter of tubes *2 1/2"* Pitch of tubes *3 3/4" x 3 3/4"* Material of tube plates *Steel* Thickness: Front *1 3/32"* Back *1 5/16"* Mean pitch of stays *11 1/4" x 7 1/2"*
 Pitch across wide water spaces *13 3/4"* Working pressures by rules *243* Girders to Chamber tops: Material *Steel* Depth and *✓*
 Thickness of girder at centre *8 1/2" x 1 3/4"* Length as per rule *29 1/2"* Distance apart *9 1/4"* Number and pitch of stays in each *three 7 3/4"*
 Working pressure by rules *227* Steam dome: description of joint to shell *none* % of strength of joint *✓* Diameter *✓*
 Thickness of shell plates *✓* Material *✓* Description of longitudinal joint *✓* Diameter of rivet holes *✓* Pitch of rivets *✓*
 Working pressure of shell by rules *✓* Crown plates: Thickness *✓* How stayed *✓*

W1200-0186

SUPERHEATER. Type "C M C W" Date of Approval of Plan 17-3-20 & 20-7-20. Tested by Hydraulic Pressure to 450 lbs

Date of Test 23/30/7/20 23/8/20 25/10/20 Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler yes

Diameter of Safety Valve 3" Pressure to which each is adjusted 229 lbs Is Easing Gear fitted yes

IS A DONKEY BOILER FITTED? no. If so, is a report now forwarded? ✓

SPARE GEAR. State the articles supplied:— 2 studs & nuts for each size of rotor bearing. 2 ditto for main gear wheel bearing. 2 ditto for pinion bearing. 2 sets coupling bolts & nuts (2 sizes) to total number bolts, studs & nuts for each gear case & turbine case joints. 2 thermometers for oil circulating system. 2 halves main gear wheel shaft bearings. 8 halves rotor shaft bearings. 4 pairs pinion shaft bearings. 1 set packing rings for each gland of rotor shaft & 1/2 number of springs for ditto. 2 half rings for main thrust block. 1 set of pads for Mitchell adjusting block of each size. 1 set of liners for ditto. 1 complete set of valves for all pumps. 1 bucket & rod for lubrication pump. 1 safety valve spring for each boiler. 1 edge valve spring each size. Assorted bolts & nuts. Propeller shaft. 1 propeller blade. 1 H.C. pinion. 1 L.P. pinion. 4 check valves. Various parts for circ pump & fan engines.

The foregoing is a correct description, FOR THE CENTRAL MARINE ENGINE WORKS, (Ld. Eng. & Co. (1919) Ltd.)

Manufacturer. Propeller shaft. 1 propeller blade. 1 H.C. pinion. 1 L.P. pinion. 4 check valves. Various parts for circ pump & fan engines.

Dates of Survey while building { During progress of work in shops -- 1919. Oct 10. 1920. Mar 30. Apr 5. 12. 13. 15. 16. 19. 20. 22. 23. 26. 27. 29. May 4. 6. 10. 12. 13. 14. 17. 19. 27. 28. June 7. 8. 14. 17. 18. 21. 22. 25. 28. 29. 30. July 2. 5. 9. 12. 13. 14. 19. 20. 23. 28. 30. Aug 11. 20. 23. 24. 31. Sep 1. 5. 9. 10. 16. 27. 30. 29. 30. Oct 4. 5. 6. 7. 11. 13. 14. 15. 19. 20. 21. 22. 25. Nov 1. 2. 5. 10. 19. 22. 25. 26. 30. Dec 1. 3. 6. 8. 13. 14. 15. 17. 20. 22. 23. 29. 30. 1921. Jan 6. 7. 10. 11. 14. 17. 19. 21. 25. 26. Feb 1. 3. 4. 5. 9. 10. 11. 14. 15. 16. 17. 18. 21. 22. 23. 24. 25. Mar 1. 128. Is the approved plan of main boiler forwarded herewith? yes

Dates of Examination of principal parts—Casings 8/6 to 27/9/20 Rotors 14/6 to 29/7/20 Blading 27/6 to 20/8/20 Gearing 1/6 to 22/10/20

Rotor shafts 6-10-20 Thrust shaft 20-9-20 Tunnel shafts 20-9-20 Screw shaft 14-10-20 Propeller 18-10-20

Stern tube 7-1-21 Steam pipes tested 8-9-10-11-14-16-17-18-21-22-23-24-25-26-27-28-29-30-31-1921. Engine and boiler seatings 11-10-20 Engines holding down bolts 4-2-21

Completion of pumping arrangements 3-3-21 Boilers fixed 21-2-21 Engines tried under steam 15-9-21

Main boiler safety valves adjusted 13-9-21 Thickness of adjusting washers P.T.B. P₅₂ S₅₂ G.M.B. P₇₅ S₇₅ S.F.B. P₈ S₈ For B. P₇ S₇

Material and tensile strength of Rotor shaft S.M. Steel. 34-38 tons. Identification Mark on Do. 6199

Material and tensile strength of Pinion shaft Nickel Steel 40-45 tons. Identification Mark on Do. 6199

Material of Wheel shaft S.M. Steel Identification Mark on Do. 6199 Material of Thrust shaft S.M. Steel Identification Mark on Do. 6199

Material of Tunnel shafts S.M. Steel Identification Marks on Do. 6199 Material of Screw shafts S.M. Steel Identification Marks on Do. 6199

Material of Steam Pipes Lap welded steel & lap welded iron Test pressure 675 lbs.

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 Section 49 of the Rules been complied with ✓

Is this machinery a duplicate of a previous case? turbines yes "City of Adelaide" boiler no.

General Remarks (State quality of workmanship, opinions as to class, &c.) This vessel's machinery has been built under Special Survey and is in accordance with the Rules. The materials and workmanship are good. After placing and securing the machinery on board the vessel has returned to Sunderland for completion by the fitting of steam, exhaust and pumping connections and trying under steam.

On completion of the survey this vessel's machinery in my opinion will be eligible to have the notation **L.M.C.** with date 14/9/21. Steam and exhaust and pumping connections now completed. Engines tried under steam. Machinery now ready to be fitted with in our opinion to have notation of **L.M.C.** 9-21

The amount of Entry Fee ... £ 6 : 0 : 0 When applied for, Special ... £ 113 : 9 : 0 When received, 19 Donkey Boiler Fee ... £ : : Travelling Expenses (if any) £ : : 14-4-21

R.D. Shilston, Esq. Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 30 SEP. 1921

Assigned

+ L.M.C. 9-21



© 2021

Lloyd's Register Foundation